FOURTH ADDENDUM

TO THE

BRITISH PHARMACOPŒIA

1932

PUBLISHED UNDER THE DIRECTION OF

THE GENERAL COUNCIL OF
MEDICAL EDUCATION AND REGISTRATION
OF THE UNITED KINGDOM

PURSUANT TO THE ACTS
XXI & XXII VICTORIA CAP XC (1858)
AND XXV & XXVI VICTORIA CAP XCI (1862)

OFFICIAL FROM OCTOBER 1st, 1941.

LONDON
PUBLISHED FOR THE GENERAL MEDICAL COUNCIL
BY
CONSTABLE & CO. LTD. 10 ORANGE STREET LEICESTER SQUARE W.C.2

Printed in Great Britain by Butler & Tanner Ltd., Frome and London

CONTENTS

NOTICE

By Section 2 of the Medical Council Act, 1862, the exclusive right of publishing, printing, and selling the British Pharmacopœia is vested in the General Council of Medical Education and Registration of the United Kingdom.

The British Pharmacopœia, 1932, superseded previous issues of the British Pharmacopœia, being for all purposes deemed to be substituted for such previous issues.

The Addendum, 1936, the Second Addendum, 1940, and the Third Addendum, 1941, altered and amended the British Pharmacopœia, 1932, and this Fourth Addendum effects further alterations and emendations. The General Notices and Appendices included in the British Pharmacopœia, 1932, the Addendum, 1936, the Second Addendum, 1940, and the Third Addendum, 1941, apply to all matter contained in this Addendum, unless the contrary is specifically stated.

This Addendum has the same authority as the British Pharmacopœia, 1932, as amended by the Addendum, 1936, the Second Addendum, 1940, and the Third Addendum, 1941. Monographs or appendices of the British Pharmacopœia, 1932, or of these Addenda, which are amended by this Fourth Addendum, supersede, in their amended forms, the original monographs or appendices.

NOTICE CONCERNING PATENTS

In the case of certain substances included in this Addendum, attention is called to the fact that, in so far as these are protected by Letters Patent, it is, or may be, necessary to obtain Licence to manufacture from the Comptroller-General of Patents, Designs and Trade Marks. (See Patents and Designs Acts, 1907 to 1938, and Patents, Designs, Copyright and Trade Marks (Emergency) Act, 1939.)

PREFACE

TO THE FOURTH ADDENDUM TO THE BRITISH PHARMACOPŒIA, 1932

SECTION 54 of the Medical Act, 1858, provides that the General Council of Medical Education and Registration of the United Kingdom 'shall cause to be published under their direction a Book containing a list of medicines and compounds, and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed, and containing such other matter and things relating thereto as the General Council shall think fit, to be called "The British Pharmacopœia"; and the General Council shall cause to be altered, amended, and republished, such Pharmacopœia as often as they shall deem it necessary.'

This Addendum to the British Pharmacopœia, 1932, has been prepared by the British Pharmacopœia Commission and approved by the Pharmacopœia Committee of the Council in the discharge of the duty entrusted to them by the Standing Orders of the Council to deal with all matters relating to the preparation and publication of the British Pharmacopœia.

The Pharmacopœia Committee of the Council, in a Report made by it to the Council in accordance with the Standing Orders, has conveyed to the Council a cordial expression of its appreciation of the work done by the Commission in preparing this Addendum; and also by the persons and bodies, both in this country and abroad, by whose collaboration that task has been facilitated.

GENERAL MEDICAL COUNCIL OFFICE,
44 HALLAM STREET, PORTLAND PLACE,
LONDON, W.1.

THE BRITISH PHARMACOPŒIA COMMISSION

*Chairman :** J. A. GUNN, M.D., Professor of Therapeutics in the University of Oxford.

R. R. BENNETT, B.Sc., Chairman of the British Pharmaceutical Conference, 1928 and 1929.

O. L. V. S. DE WESSELOW, D.M., Professor of Medicine in the University of London.

F. R. FRASER, M.D., Professor of Medicine in the University of London.

P. HARTLEY, C.B.E., M.C., D.Sc., Director of Biological Standards, the National Institute for Medical Research, Hampstead.

B. F. HOWARD, Vice-President of the Institute of Chemistry, 1930–1933.

D. HUNTER, M.D., Physician to the London Hospital.

W. H. LINNELL, D.Sc., Reader in Pharmaceutical Chemistry in the University of London.

T. TICKLE, B.Sc., Public Analyst to the County of Devon.

Secretary : C. H. HAMPSHIRE, M.B., B.Sc.

* Dr. A. P. BEDDARD, Consulting Physician to Guy's Hospital, was Chairman of the Commission until his death in November 1939.

Additions to the British Pharmacopœia, 1932

Acidum Mandelicum
Acidum Nicotinicum
Benzylis Benzoas
Bismuthi Subgallas
Digoxinum
Ephedrina
Injectio Calcii Gluconatis
Injectio Nikethamidi
Injectio Procainæ et Adrenalinæ
Injectio Quininæ et Urethani
Injectio Sodii Morrhuatis
Liquor Sodii Hydroxidi
Magnesii Trisilicas
Morphinæ Sulphas
Pamaquinum
Paraffinum Liquidum Leve
Phenylhydrargyri Nitras
Proflavinæ Sulphas
Sodii Metabisulphis
Sodii Morrhuas
Sodii Sulphas Exsiccatus
Sulphanilamidum
Suraminum
Unguentum Hamamelidis
Unguentum Hydrargyri Dilutum
Urethanum

Monographs added to the British Pharmacopœia, 1932, by Notice in the London, Edinburgh, Belfast and Dublin Gazettes, with effect from February 28th, 1941

Sodii Lactas
Urginea
Valeriana Indica

Monographs of the British Pharmacopœia, 1932, and Addenda, which were amended by Notice in the London, Edinburgh, Belfast and Dublin Gazettes, with effect from February 28th, 1941

Acetum Scillæ
Cataplasma Kaolini
Mepacrinæ Hydrochloridum
Oxymel Scillæ
Scilla
Tinctura Scillæ
Tinctura Valerianæ Ammoniata
Valeriana

Monographs of the British Pharmacopœia, 1932, and Addenda, which are amended by the Fourth Addendum

Aquæ Aromaticæ
Aqua Anethi Concentrata
Aqua Camphoræ
Aqua Chloroformi
Aqua Cinnamomi Concentrata
Aqua Menthæ Piperitæ Concentrata
Elixir Cascaræ Sagradæ
Ephedrinæ Hydrochloridum
Glycerinum Acidi Tannici
Glycerinum Aluminis
Infusum Aurantii Recens
Infusum Buchu Recens
Infusum Calumbæ Recens
Infusum Caryophylli Recens
Infusum Digitalis Recens
Infusum Gentianæ Compositum Recens
Infusum Quassiæ Recens
Infusum Senegæ Recens
Infusum Sennæ Recens
Injectio Bismuthi
Injectio Bismuthi Oxychloridi
Injectio Bismuthi Salicylatis
Injectio Ferri
Injectio Hydrargyri
Injectio Hydrargyri Subchloridi
Injectio Mersalyli
Liquor Sodæ Chlorinatæ Chirurgicalis
Liquor Sodii Chloridi Physiologicus
Mel Boracis
Menthol
Mistura Magnesii Hydroxidi
Mistura Sennæ Composita
Oleum Hippoglossi
Syrupus Pruni Serotinæ
Tinctura Cardamomi Composita
Tinctura Ipecacuanhæ
Tinctura Rhei Composita
Unguentum Acidi Tannici
Unguentum Hydrargyri

Appendices to the British Pharmacopœia, 1932, which were amended by Notice in the London, Edinburgh, Belfast and Dublin Gazettes, with effect from February 28th, 1941

Appendix VI. Quantitative Test for Lead
Appendix VII. Quantitative Test for Arsenic

Appendices to the British Pharmacopœia, 1932, and Addenda, which are amended by the Fourth Addendum

Appendix I. Materials and Solutions Employed in Tests
Appendix II. A. Solutions Employed in Volumetric Determinations
Appendix IV. A. Determination of Freezing-Point, of Melting-Point, and of Solidifying-Point
Appendix IV. F. Determination of Viscosity
Appendix VI. Quantitative Test for Lead
Appendix VII. Quantitative Test for Arsenic
Appendix VIII. C. Limit Test for Iron
Appendix XVI. Special Processes Used in Preparing Solutions and Suspensions for Parenteral Injection

MONOGRAPHS

ACETUM SCILLÆ

[Acet. Scill.]

Vinegar of Squill

Indian Squill may be used, in place of Squill, in making this Vinegar.

ACIDUM MANDELICUM

[Acid. Mandelic.]

Mandelic Acid

Synonym. Phenylglycollic Acid.

$C_6H_5 \cdot CH(OH) \cdot COOH$ . . Mol. Wt. 152·06

Mandelic Acid may be prepared by the action of sodium cyanide on the sodium bisulphite addition compound of benzaldehyde and hydrolysis of the mandelonitrile thus produced. It contains not less than 99·5 per cent. of $C_8H_8O_3$.

Characters. White crystals which slowly turn yellow when exposed to light; almost odourless; taste, acid and saline.

Soluble in about 7 parts of *water* and in about 1 part of *alcohol (95 per cent.)*.

Tests for Identity. An aqueous solution is acid to *solution of litmus*.

Dissolve about 0·25 gramme in 10 millilitres of *water* and add 2 drops of *test-solution of ferric chloride*; a bright yellow colour is produced.

Dissolve about 0·25 gramme in 5 millilitres of *water*, add 5 millilitres of *sulphuric acid* and mix; add 10 millilitres of *sulphuric acid* and mix by rotating the tube; a purple colour slowly forms and benzaldehyde, recognisable by its odour, is produced.

Tests for Purity. *Melting-point*, 119° to 121°.

Complies with the test for limit of chlorinated compounds described under 'Acidum Benzoicum'.

2 grammes complies with the *limit test for sulphates*.

Arsenic limit, 2 parts per million. *Lead limit*, 5 parts per million.

1 gramme loses, when dried at 100°, not more than 0·005 gramme; and leaves, on incineration, not more than 0·001 gramme of residue.

Assay. Dissolve about 0·3 gramme, accurately weighed, in 50 millilitres of recently boiled and cooled *water* and titrate with *N/10 sodium hydroxide*, using *solution of phenolphthalein* as indicator. Each millilitre of *N/10 sodium hydroxide* is equivalent to 0·01521 gramme of $C_8H_9O_3$.

Storage. Mandelic Acid should be stored in a well-closed container, protected from light.

DOSES

Metric.	Imperial.
2 to 4 grammes.	30 to 60 grains.

ACIDUM NICOTINICUM

[Acid. Nicotin.]

Nicotinic Acid

$C_5H_4N{\cdot}COOH$ . . . Mol. Wt. 123·1

Nicotinic Acid is pyridine-3-carboxylic acid and may be obtained from nicotine by the action of a suitable oxidising agent. It contains not less than 99·5 per cent. of $C_6H_5O_2N$, calculated with reference to the substance dried at 100°.

Characters. White crystals or crystalline powder; odourless; taste, feebly acid.

Soluble in 75 parts of *water* at 15°; readily soluble in boiling *water* and in boiling *alcohol (95 per cent.)*; soluble in solutions of alkalis; almost insoluble in *ether*.

Tests for Identity. *Melting-point*, 234° to 237°.

Heat a small quantity with four times its weight of *soda lime*; pyridine, recognisable by its odour, is produced.

To 2 millilitres of a 0·1 per cent. w/v solution in *water*, add 6 millilitres of *solution of cyanogen bromide* and 1 millilitre of a 2·5 per cent. w/v solution of *aniline* in *water*; a golden-yellow colour is produced; with stronger solutions a red precipitate is slowly formed.

Tests for Purity. Dissolve 1 gramme in 100 millilitres of *water*; one half of this solution, treated as in the *limit test for chlorides*, gives no greater opalescence than a *standard opalescence* prepared from 0·5 millilitre of *N/100 hydrochloric acid*; the other half, treated as in the *limit test for sulphates*, gives no greater turbidity than a *standard turbidity* prepared from 0·3 millilitre of *N/100 sulphuric acid*.

Arsenic limit, 2 parts per million. *Lead limit*, 10 parts per million.

Loses, when dried at 100°, not more than 1 per cent. of its weight.

Moisten 1 gramme with *sulphuric acid*, ignite gently, again moisten with *sulphuric acid*, and re-ignite; the residue weighs not more than 0·002 gramme.

Assay. Dissolve about 0·3 gramme, accurately weighed, in 50 millilitres of recently boiled and cooled *water*, and titrate with *N/10 sodium hydroxide*, using *solution of phenolphthalein* as indicator. Each millilitre of *N/10 sodium hydroxide* is equivalent to 0·01231 gramme of $C_9H_9O_2N$.

DOSES

Metric.	Imperial.
0·06 to 0·1 gramme.	1/4 to 1 1/2 grains.

AQUÆ AROMATICÆ

Aromatic Waters

See 'Aqua Destillata'.

AQUA CAMPHORÆ

[Aq. Camph.]

Camphor Water

See 'Aqua Destillata'.

AQUA CHLOROFORMI

[Aq. Chlorof.]

Chloroform Water

See 'Aqua Destillata'.

AQUA DESTILLATA

[Aq. Dest.]

Distilled Water

Suitable potable water may be used, in place of Distilled Water, in making the following preparations:—

Aquæ Aromaticæ
Aqua Anethi Concentrata
Aqua Camphoræ
Aqua Chloroformi
Aqua Cinnamomi Concentrata
Aqua Menthæ Piperitæ Concentrata
Infusum Aurantii

Infusum Aurantii Recens
Infusum Buchu
Infusum Buchu Recens
Infusum Calumbæ
Infusum Calumbæ Recens
Infusum Caryophylli
Infusum Caryophylli Recens
Infusum Digitalis Recens
Infusum Gentianæ Compositum
Infusum Gentianæ Compositum Recens
Infusum Quassiæ
Infusum Quassiæ Recens
Infusum Senegæ
Infusum Senegæ Recens
Infusum Sennæ
Infusum Sennæ Recens
Liquor Sodæ Chlorinatæ Chirurgicalis

BENZYLIS BENZOAS

[Benzyl. Benz.]

Benzyl Benzoate

$C_6H_5 \cdot CO_2 \cdot CH_2 \cdot C_6H_5$ . . Mol. Wt. 212·1

Benzyl Benzoate may be prepared by the esterification of benzyl alcohol with benzoic acid. It contains not less than 99 per cent of $C_{14}H_{12}O_2$.

Characters. Colourless crystals or a colourless oily liquid odour, faintly aromatic; taste, sharp and burning.

Insoluble in *water*; soluble in *alcohol (90 per cent.)*, in *chloroform* and in *ether*; insoluble in *glycerin*.

Tests for Identity. Neutral to *solution of litmus*.

Boil 2 grammes with 25 millilitres of *alcoholic solution of potassium hydroxide* for two hours in a flask fitted with a reflux condenser. Remove the alcohol on a water-bath, add 50 millilitres of *water* to the liquid remaining in the flask, and distil until the liquid distilling is no longer turbid.

The liquid remaining in the flask, after neutralising with *dilute hydrochloric acid*, yields, with *test-solution of ferric chloride*, a buff-coloured precipitate and, with *hydrochloric acid*, a white crystalline precipitate of benzoic acid.

To the distillate add 2·5 grammes of *potassium permanganate* and 2 millilitres of *test-solution of sodium hydroxide*, boil for fifteen minutes in a flask fitted with a reflux condenser, cool, and filter. The filtrate, after neutralising with *dilute hydrochloric acid*, yields, with *test-solution of ferric chloride*, a buff-coloured precipitate and, with *hydrochloric acid*, a white crystalline precipitate of benzoic acid.

Boils at about 323°.

Tests for Purity. *Specific gravity (15·5°/15·5°)*, 1·121 to 1·125; *freezing-point*, not below 18·5°; *refractive index* at 20°, 1·568 to 1·570.

Ash, not more than 0·05 per cent.

Assay. Carry out the *method for the determination of esters in volatile oils*, continuing the boiling for two hours over a flame. Each millilitre of *N/2 alcoholic potassium hydroxide* is equivalent to 0·1061 gramme of $C_{14}H_{12}O_2$.

DOSES

Metric.	Imperial.
0·3 to 0·5 mil.	5 to 8 minims.

BISMUTHI SUBGALLAS

[Bism. Subgall.]

Bismuth Subgallate

Synonyms. Bismuth Oxygallate: Basic Bismuth Gallate.

Bismuth Subgallate may be prepared by the action of gallic acid on freshly precipitated hydrated bismuth oxide.

Characters. A citron yellow powder; odourless; tasteless; stable in air.

Insoluble in *water*, in *dehydrated alcohol* and in *ether*.

Readily soluble in hot mineral acids, with decomposition, and in solutions of the alkali hydroxides, forming clear, yellow solutions, rapidly turning deep red.

Tests for Identity. Suspend about 0·1 gramme in *water*, saturate with *hydrogen sulphide* and filter. Boil the filtrate to expel the dissolved gas, cool and add one drop of *test-solution of ferric chloride*; a bluish-black colour is produced.

Yields the *reactions* characteristic of bismuth.

Tests for Purity. Shake 1 gramme with 20 millilitres of *alcohol (90 per cent.)* for one minute; filter and evaporate the filtrate to dryness on a water bath; the residue weighs not more than 0·0025 gramme (limit of free gallic acid).

Ignite 3 grammes and dissolve the residue in 4 millilitres of *nitric acid*, evaporate the solution to half its volume, dilute with *water* to 100 millilitres and filter. 5 millilitre quantities of the filtrate comply with the tests for limit of lead, and limit of copper, described under 'Bismuthi Carbonas'.

Complies with the test for absence of silver described under 'Bismuthi Salicylas'.

Complies with the test for limit of alkalis and alkaline earths described under 'Bismuthi Carbonas'.

Dissolve 0·01 gramme in a mixture of 1 millilitre of *water* and 5 millilitres of *sulphuric acid* and superimpose 5 millilitres of *solution of ferrous sulphate*; no brown or red zone is produced within five minutes (limit of nitrate).

Loses, when dried at 100°, not more than 5 per cent. of its weight.

Arsenic limit, 2 parts per million.

Leaves, on ignition followed by re-ignition at a dull red heat with a few drops of *nitric acid*, not less than 52 per cent. and not more than 57 per cent. of residue, calculated with reference to the substance dried at 100°.

Storage. Bismuth Subgallate should be stored in a well-closed container, protected from light.

DOSES

Metric.	Imperial.
0·6 to 2 grammes.	10 to 30 grains.

CATAPLASMA KAOLINI

[Cataplasm. Kaolin.]

Poultice of Kaolin

Sodium Lactate (70 per cent.) may be used, in place of Glycerin, in making this Poultice. When Sodium Lactate (70 per cent.) is used, the formula is modified as follows:—

Kaolin, finely sifted, dried at 100°	527	grammes
Boric Acid, finely sifted	45	grammes
Methyl Salicylate	2	millilitres
Oil of Peppermint	0·5	millilitre
Thymol	0·5	gramme
Sodium Lactate (70 per cent.)	425	grammes

Heat the Kaolin at 150° for one hour, allow it to cool, and add it to a mixture of the Boric Acid and Sodium Lactate (70 per cent.). Add the Thymol, previously dissolved in the Methyl Salicylate and Oil of Peppermint; mix the whole thoroughly.

DIGOXINUM

[Digoxin.]

Digoxin

$C_{41}H_{64}O_{14}$ . . . . Mol. Wt. 780·5

Digoxin is a crystalline glycoside obtained from the leaves of *Digitalis lanata* Ehrh.

Characters. Colourless, four- or five-sided tabular crystals; odourless; taste (in dilute alcoholic solution), bitter.

Almost insoluble in *water*; soluble in dilute *alcohol*; almost insoluble in *chloroform*.

Tests for Identity and Purity. *Melting-point*, 265°, with decomposition; *specific rotation* in a 2·0 per cent. w/v solution in anhydrous *pyridine* (mercury light), + 13·5° to + 13·7°.

To a solution of 0·001 gramme in 1 millilitre of *glacial acetic acid* containing 0·01 per cent. w/v of *ferric chloride* add 1 millilitre of *sulphuric acid* so as to form a subjacent layer; a pure brown ring free from red colour (absence of allied glycosides) is formed at the junction of the liquids. After a short time the acetic acid layer acquires an indigo colour.

Sterilisation of a Solution. A solution in Alcohol (70 per cent.) is sterilised by *heating in an autoclave*.

DOSES

Metric.	Imperial.
Oral.	
Initial doses.	
0·001 to 0·0015 gramme.	$^1/_{60}$ to $^1/_{40}$ grain.
Maintenance doses.	
0·00025 gramme twice daily.	$^1/_{240}$ grain twice daily.
By intravenous injection.	
0·0005 to 0·001 gramme.	$^1/_{120}$ to $^1/_{60}$ grain.

For intravenous injection a sterile solution containing 0·0005 gramme in 1 mil of Alcohol (70 per cent.) is diluted, immediately before use, with ten times its volume of Physiological Solution of Sodium Chloride.

NOTE.—In Great Britain and Northern Ireland Digoxin will be controlled by patents until the 8th August, 1945.

ELIXIR CASCARÆ SAGRADÆ

[Elix. Casc. Sagr.]

Elixir of Cascara Sagrada

This Elixir may be made according to the following modified formula.

Cascara Sagrada, in *coarse powder*	1000	grammes
Liquorice, unpeeled, in *coarse powder*	125	grammes
Light Magnesium Oxide	150	grammes
Soluble Saccharin	1	gramme
Oil of Coriander	0·15	millilitre
Oil of Anise	0·2	millilitre
Chloroform	5	millilitres
Alcohol (90 per cent.)	12·5	millilitres
Distilled Water, sufficient to produce	1000	millilitres

Mix the Cascara Sagrada, Liquorice and Light Magnesium Oxide and moisten with 1250 millilitres of boiling Distilled Water, stirring thoroughly. Macerate for twenty-four hours in a well-covered vessel; pack moderately tightly in a percolator, and percolate with boiling Distilled Water until exhausted. Evaporate the percolate on a water-bath until it measures 950 millilitres. Dissolve the Soluble Saccharin in 12 millilitres of Distilled Water; dissolve the Chloroform, Oil of Coriander and the Oil of Anise in the Alcohol (90 per cent.). Mix the solutions, add the concentrated percolate and sufficient Distilled Water to produce the required volume, and shake thoroughly. Set aside for not less than twelve hours; filter, if necessary.

EPHEDRINA

[Ephed.]

Ephedrine

$[C_6H_5{\cdot}CH(OH){\cdot}CH(NH{\cdot}CH_3){\cdot}CH_3]_2,H_2O$ Mol. Wt. 348·3

Ephedrine is the hemihydrate of *l*-α-hydroxy-β-methylaminopropylbenzene, an alkaloid obtained from *Ephedra sinica* Stapf, *Ephedra equisetina* Bunge, and other species of *Ephedra*, or prepared by synthesis. It contains not less than 94·0 per cent. and not more than 95·0 per cent. of $C_{10}H_{15}ON$.

Characters. Colourless, non-deliquescent, non-efflorescent, hexagonal, prismatic crystals; odourless, or has acquired a slight, unpleasant smell.

Readily soluble in *water*, in *alcohol* (*95 per cent.*), in *ether* and in *chloroform*, the solution in *chloroform* being turbid due to separation of water. Soluble in about 20 parts of *glycerin*, in about 25 parts of *olive oil*, and in about 100 parts of *liquid paraffin*, with separation of water, only the anhydrous alkaloid forming a clear solution in that solvent.

Tests for Identity. An aqueous solution is strongly alkaline to *solution of litmus*.

Dissolve 0·01 gramme in 1 millilitre of *water* and 0·2 millilitre of *dilute hydrochloric acid*, and add 0·1 millilitre of *solution of copper sulphate*, followed by 1 millilitre of *test-solution of sodium hydroxide*; the liquid becomes violet; add 1 millilitre of *ether*, and shake; the ethereal layer is purple, and the aqueous layer is blue.

Dissolve 0·2 gramme in 30 millilitres of *chloroform*, set aside for twelve hours and allow the chloroform to evaporate slowly at laboratory temperature; the crystals of ephedrine hydrochloride which separate have, after drying, *melting-point*, 217° to 219°, and yield the *reactions* characteristic of chlorides.

Tests for Purity. *Melting-point*, determined without previous drying, 40° to 41°.

Melting-point of the hydrochloride obtained from the Assay, 217° to 219°.

Specific rotation of the hydrochloride obtained from the Assay in 5 per cent. w/v solution in *water*, − 33° to − 35°.

Dissolve 0·5 gramme in 5 millilitres of *water* and 1 millilitre of *dilute hydrochloric acid*, add a slight excess of *dilute solution of ammonia* and 0·5 millilitre of *solution of calcium chloride*; no opalescence is produced during ten minutes.

Dissolve 0·1 gramme in 1 millilitre of *water* and 1 millilitre of *dilute nitric acid* and add 0·1 millilitre of *solution of silver nitrate*; no turbidity is produced (absence of chlorides).

Dissolve 0·1 gramme in 1 millilitre of *water* and 1 millilitre of *dilute hydrochloric acid* and add 0·5 millilitre of *solution of barium chloride*; no turbidity is produced during ten minutes (absence of sulphates).

0·2 gramme leaves, on incineration, not more than 0·0002 gramme of residue.

Assay. Dissolve about 1·5 grammes, accurately weighed, in 5 millilitres of *alcohol* (*90 per cent.*) in an evaporating dish, add 10 millilitres of *water* and sufficient *dilute hydrochloric acid* to make the solution distinctly acid to *litmus paper*, evaporate to dryness on a water-bath, dry the residue of ephedrine hydrochloride at 100°, and weigh. 1 gramme of ephedrine hydrochloride is equivalent to 0·82 gramme of $C_{10}H_{15}ON$.

DOSES

Metric.	Imperial.
0·016 to 0·1 gramme.	1/4 to 1 1/2 grains.

EPHEDRINÆ HYDROCHLORIDUM

[Eph. Hydrochlor.]

Ephedrine Hydrochloride

British Pharmacopœia, 1932, page 150, line 30.

Tests for Purity. The *Melting-point* is changed to '217° to 219°'.

GLYCERINUM ACIDI TANNICI

[Glycer. Acid. Tann.]

Glycerin of Tannic Acid

When this Glycerin is prescribed or demanded a preparation made according to the following modified formula may be dispensed or supplied :—

Tannic Acid	194 grammes
Tragacanth, finely powdered .	12 grammes
Chloroform	5 millilitres
Alcohol (90 per cent.) . .	20 millilitres
Distilled Water, sufficient to produce	1000 millilitres

Dissolve the Tannic Acid in 500 millilitres of Distilled Water, filter and pass sufficient Distilled Water through the filter until the filtrate measures 900 millilitres. Mix the Tragacanth with a mixture of the Alcohol (90 per cent.) and the Chloroform, in a dry bottle; add, as quickly as possible, the solution of the Tannic Acid and shake vigorously. Add sufficient Distilled Water to produce the required volume; mix thoroughly.

GLYCERINUM ALUMINIS

[Glycer. Alum.]

Glycerin of Alum

Ammonia Alum may be used, in place of Potash Alum, in making this Glycerin.

INFUSA

Infusions

See 'Aqua Destillata', page 3.

INJECTIO BISMUTHI

[Inj. Bism.]

Injection of Bismuth

Precipitated Bismuth, in *very fine powder*	20	grammes
Dextrose	5	grammes
Cresol	0·5	millilitre
Distilled Water, freshly prepared, sufficient to produce	100	millilitres

Dissolve the Dextrose and the Cresol in 50 millilitres of freshly prepared Distilled Water, triturate the Precipitated Bismuth with the solution, and add sufficient freshly prepared Distilled Water to produce the required volume. Mix thoroughly, distribute in suitable containers, in which are glass balls, finally seal and sterilise by *heating in an autoclave*.

DOSES

Metric.	Imperial.
By intramuscular injection.	
0·5 to 1 mil.	**8 to 15 minims.**

Injection of Bismuth contains in 1 mil 0·2 gramme, and in 15 minims about 3 grains, of Precipitated Bismuth.

INJECTIO BISMUTHI OXYCHLORIDI

[Inj. Bism. Oxychlor.]

Injection of Bismuth Oxychloride

Bismuth Oxychloride, in *very fine powder*	10	grammes
Dextrose	5	grammes
Chlorocresol	0·2	gramme
Distilled Water, freshly prepared, sufficient to produce	100	millilitres

Dissolve the Chlorocresol in 80 millilitres of freshly prepared Distilled Water with the aid of gentle heat. Cool. Dissolve the Dextrose in this solution. Triturate the Bismuth Oxychloride with the solution and add

sufficient freshly prepared Distilled Water to produce the required volume. Mix thoroughly, transfer to suitable containers, finally seal, and sterilise by heating at 98° to 100° for a period sufficient to ensure that the whole of the suspension is maintained at that temperature for thirty minutes.

DOSES

Metric.	Imperial.
By intramuscular injection.	
1 to 2 mils.	**15 to 30 minims.**

Injection of Bismuth Oxychloride contains in 2 mils 0·2 gramme, and in 30 minims about 3 grains, of Bismuth Oxychloride.

INJECTIO BISMUTHI SALICYLATIS

[Inj. Bism. Salicyl.]

Injection of Bismuth Salicylate

Bismuth Salicylate, in *very fine powder*	10 grammes
Camphor	1 gramme
Phenol	1 gramme
Olive Oil, or Arachis Oil, sufficient to produce	100 millilitres

Sterilise about 110 millilitres of Olive Oil, or Arachis Oil, by heating at 150° for a period sufficient to ensure that the whole of the Oil is maintained at that temperature for one hour. Dissolve the Camphor and the Phenol in 50 millilitres of the sterilised oil, triturate the Bismuth Salicylate with the solution in a sterilised mortar, and add sufficient of the sterilised oil to produce the required volume. Mix thoroughly, transfer to suitable sterilised containers, and seal.

DOSES

Metric.	Imperial.
By intramuscular injection.	
0·6 to 1·2 mils.	**10 to 20 minims.**

Injection of Bismuth Salicylate contains in 1·2 mils 0·12 gramme, and in 20 minims about 2 grains, of Bismuth Salicylate.

INJECTIO CALCII GLUCONATIS

[Inj. Calc. Glucon.]

Injection of Calcium Gluconate

Calcium Gluconate . . .	10 grammes
Distilled Water, freshly prepared	95 millilitres

Dissolve the Calcium Gluconate in the freshly prepared Distilled Water with the aid of heat, and clarify the hot solution by passing through a suitable filter. Distribute in carefully washed ampoules, seal, and sterilise by *heating in an autoclave.*

DOSES

Metric.	Imperial.
10 to 20 mils.	150 to 300 minims.

Injection of Calcium Gluconate contains in 20 mils about 2 grammes, and in 300 minims about 30 grains, of Calcium Gluconate.

Injection of Calcium Gluconate is a supersaturated solution and must be completely free from solid particles. If solid particles are present, separation of crystals may occur and the injection must not be used.

INJECTIO FERRI

[Inj. Ferr.]

Injection of Iron

The direction to sterilise by *Tyndallisation* is deleted.

INJECTIO HYDRARGYRI

[Inj. Hydrarg.]

Injection of Mercury

Synonym. Mercurial Cream.

Mercury	10 grammes
Wool Fat	50 grammes
Camphor	10 grammes
Creosote	10 millilitres
Olive Oil, or Arachis Oil . .	23 millilitres

Sterilise the Wool Fat and the Olive Oil, or Arachis Oil, separately by heating at 150° for a period sufficient to ensure that the whole is maintained at that temperature for one hour. Triturate the Mercury with 10 grammes of the sterilised Wool Fat in a sterilised mortar, until metallic globules cease to be visible under a lens magnifying four diameters; then incorporate the remainder of the sterilised Wool Fat. Add the Camphor, previously dissolved in the Creosote, and then the sterilised Olive Oil, or Arachis Oil. Mix thoroughly, transfer to suitable sterilised containers, and seal.

DOSES

Metric.	Imperial.
By intramuscular injection.	
0·3 to 0·6 mil.	**5 to 10 minims.**

Injection of Mercury contains in 0·6 mil about 0·06 gramme, and in 10 minims about 1 grain, of Mercury.

INJECTIO HYDRARGYRI SUBCHLORIDI

[Inj. Hydrarg. Subchlor.]

Injection of Mercurous Chloride

Synonym. Calomel Injection.

Mercurous Chloride, in *very fine powder*	5 grammes
Wool Fat	50 grammes
Camphor	10 grammes
Creosote	10 millilitres
Olive Oil, or Arachis Oil	23 millilitres

Sterilise the Wool Fat and the Olive Oil, or Arachis Oil, separately by heating at 150° for a period sufficient to ensure that the whole is maintained at that temperature for one hour. Triturate the Mercurous Chloride with a little of the sterilised Olive Oil, or Arachis Oil, in a sterilised mortar. Add the sterilised Wool Fat and the remainder of the sterilised Oil, and incorporate the Camphor, previously dissolved in the Creosote. Mix thoroughly, transfer to suitable sterilised containers and seal.

DOSES

Metric.	Imperial.
By intramuscular injection.	
0·6 to 1·2 mils.	**10 to 20 minims.**

Injection of Mercurous Chloride contains in 1·2 mils about 0·06 gramme, and in 20 minims about 1 grain, of Mercurous Chloride.

INJECTIO MERSALYLI

[Inj. Mersalyl.]

Injection of Mersalyl

Mersalyl . . .	10 grammes
Theophylline . .	5 grammes
Solution of Sodium Hydroxide . . .	1·5 millilitres
	or a sufficient quantity
Distilled Water, freshly prepared, sufficient to produce . . .	100 millilitres

Dissolve the Mersalyl in about 80 millilitres of freshly prepared Distilled Water. Dissolve the Theophylline in this solution without the aid of heat, and add Solution of Sodium Hydroxide gradually until 1 drop of the resulting solution gives a green or blue colour with 1 drop of *solution of bromothymol blue*, and a full yellow colour with 1 drop of *solution of thymol blue*. Then add sufficient freshly prepared Distilled Water to produce the required volume. Mix thoroughly, clarify the solution by filtration through a filter candle, and sterilise by *heating in an autoclave* for twenty minutes at 110°, or by *filtration*.

Storage. Injection of Mersalyl should be protected from light.

DOSES

Metric.	Imperial.
0·5 to 2 mils.	**8 to 30 minims.**

Injection of Mersalyl contains in 2 mils about 0·2 gramme of Mersalyl, and about 0·1 gramme of Theophylline, and in 30 minims about 3 grains of Mersalyl, and about 1½ grains of Theophylline.

INJECTIO NIKETHAMIDI

[Inj. Nikethamid.]

Injection of Nikethamide

Nikethamide	25 grammes
Distilled Water, freshly prepared, sufficient to produce .	100 millilitres

Dissolve the Nikethamide in part of the freshly prepared Distilled Water, filter, and add a sufficient quantity of the freshly prepared Distilled Water to produce the required volume. Sterilise by *heating in an autoclave* or by *filtration*.

DOSES

Metric.	Imperial.
By subcutaneous or intramuscular injection.	
1 to 4 mils.	**15 to 60 minims.**
By intravenous injection as a convulsant.	
5 to 16 mils.	**75 to 240 minims.**

Injection of Nikethamide contains in 4 mils 1 gramme, in 60 minims 13·5 grains, in 16 mils 4 grammes, and in 240 minims 54 grains of Nikethamide.

INJECTIO PROCAINÆ ET ADRENALINÆ

[Inj. Procain. et Adrenal.]

Injection of Procaine and Adrenaline

Procaine Hydrochloride . .	2	grammes
Sodium Chloride . . .	0·5	gramme
Chlorocresol	0·1	gramme
Solution of Adrenaline Hydrochloride	2	millilitres
Sodium Metabisulphite . .	0·1	gramme
Distilled Water, freshly prepared, sufficient to produce .	100	millilitres

Dissolve the Chlorocresol in about 90 millilitres of freshly prepared Distilled Water with the aid of gentle heat. Cool. Dissolve the Procaine Hydrochloride, the Sodium Chloride and the Sodium Metabisulphite in this solution, and add the Solution of Adrenaline Hydrochloride and sufficient freshly prepared Distilled Water to produce the required volume. Distribute the solution in suitable containers and finally seal. When the volume in each container does not exceed 30 millilitres, expose the containers to a temperature of 98° to 100° for thirty minutes; when

the volume in each container exceeds 30 millilitres, expose the containers for a longer time, sufficient to ensure that the whole of the solution in each container is maintained at a temperature of 98° to 100° for thirty minutes.

The containers comply with the *tests for limit of alkalinity of glass*.

Storage. Injection of Procaine and Adrenaline should be protected from the light.

INJECTIO QUININÆ ET URETHANI

[Inj. Quinin. et Urethan.]

Injection of Quinine and Urethane

Quinine Hydrochloride	12·5	grammes
Urethane	6·25	grammes
Chlorocresol	0·1	gramme
Distilled Water, freshly prepared, sufficient to produce	100	millilitres

Dissolve the Chlorocresol in 80 millilitres of freshly prepared Distilled Water with the aid of gentle heat. Cool. Dissolve the Quinine Hydrochloride and the Urethane in this solution and add sufficient freshly prepared Distilled Water to produce the required volume. Sterilise by *heating in an autoclave*, or by *filtration*.

DOSES

Metric.	Imperial.
By intravenous injection, as a sclerosing agent.	
0·5 to 5 mils.	**8 to 75 minims.**

Injection of Quinine and Urethane may undergo separation of solid matter on standing; such solid matter should be redissolved by warming, and the syringe used should be previously warmed.

INJECTIO SODII MORRHUATIS

[Inj. Sod. Morrh.]

Injection of Sodium Morrhuate

Sodium Morrhuate	5	grammes
Chlorocresol	0·1	gramme
Alcohol (90 per cent.)	1	millilitre
Distilled Water, freshly prepared, sufficient to produce	100	millilitres

Dissolve the Chlorocresol in 90 millilitres of freshly prepared Distilled Water with the aid of gentle heat. Cool. Dissolve the Sodium Morrhuate in the solution, add the Alcohol (90 per cent.) and sufficient freshly prepared Distilled Water to produce the required volume. Sterilise by *heating in an autoclave* or by *filtration*.

DOSES

Metric.	Imperial.
By intravenous injection, as a sclerosing agent.	
0·5 to 5 mils.	**8 to 75 minims.**

Injection of Sodium Morrhuate may undergo separation of solid matter on standing; such solid matter should be redissolved by warming, and the syringe used should be previously warmed.

LIQUOR SODÆ CHLORINATÆ CHIRURGICALIS

[Liq. Sod. Chlorinat. Chir.]

Surgical Solution of Chlorinated Soda

See 'Aqua Destillata', page 3.

LIQUOR SODII CHLORIDI PHYSIOLOGICUS

[Liq. Sod. Chlorid. Physiol.]

Physiological Solution of Sodium Chloride

The direction to sterilise by *Tyndallisation* is deleted.

LIQUOR SODII HYDROXIDI

[Liq. Sod. Hydrox.]

Solution of Sodium Hydroxide

Solution of Sodium Hydroxide is an aqueous solution of Sodium Hydroxide, containing 3·56 per cent. w/v of total alkali, calculated as NaOH (limits, 3·4 to 3·7).

Characters. A colourless, strongly alkaline liquid. *Specific gravity* (15·5°/15·5°), about 1·037.

Assay. Titrate 20 millilitres with *N/1 sulphuric acid*, using *solution of methyl orange* as indicator. Each millilitre of *N/1 sulphuric acid* is equivalent to 0·0400 gramme of total alkali, calculated as NaOH.

Storage. Solution of Sodium Hydroxide should be kept in a well-closed bottle of green glass.

Equal volumes of Solution of Sodium Hydroxide and Solution of Potassium Hydroxide contain equivalent amounts of total alkali.

MAGNESII TRISILICAS

[Mag. Trisil.]

Magnesium Trisilicate

Magnesium Trisilicate is a magnesium silicate of the approximate composition $2MgO,3SiO_2$, containing water of hydration and of crystallisation. It may be prepared by the interaction of solutions of magnesium sulphate and sodium silicate. It contains magnesium equivalent to not less than 30·0 per cent., and not more than 31·5 per cent., of MgO, and silicon equivalent to not less than 68·5 per cent., and not more than 69·5 per cent., of SiO_2, both calculated with reference to the substance ignited at a dull red heat.

Characters. A white, or nearly white, powder; odourless; slightly hygroscopic. Insoluble in *water*.

Tests for Identity. Boil 0·5 gramme with 10 millilitres of *solution of sodium carbonate*, filter, acidify the filtrate with *hydrochloric acid* and boil; a white gelatinous precipitate is slowly produced. Wash the residue on the filter with *water*, dissolve it in *dilute hydrochloric acid* and filter; the filtrate yields the *reactions* characteristic of magnesium.

Tests for Purity. Heat 0·3 gramme with 100 millilitres of *N/20 hydrochloric acid* in a stoppered vessel at 37° for three hours, shaking for half a minute at intervals of fifteen minutes, and filter. Cool the filtrate, and titrate 50 millilitres with *N/10 sodium hydroxide* using *solution of methyl red* as indicator. Calculate the volume of *N/20 hydrochloric acid* retained with reference to the substance ignited at a dull red heat; 1 gramme of the ignited substance requires not less than 250 millilitres of *N/20 hydrochloric acid*.

Boil 1 gramme with 5 millilitres of *dilute nitric acid* and 30 millilitres of *water* and filter; the filtrate complies with the *limit test for chlorides*.

Boil 0·5 gramme with 5 millilitres of *dilute hydrochloric acid* and 30 millilitres of *water* and filter: the filtrate complies with the *limit test for sulphates*.

Boil 0·1 gramme with 5 millilitres of *dilute hydrochloric acid FeT*., filter and wash the residue on the filter with *water*; the mixed filtrate and washings, after the addition of 1 drop of *solution of potassium permanganate*, comply with the *limit test for iron*.

Arsenic limit, 2 parts per million. *Lead limit*, 10 parts per million.

Loses, when ignited at a dull red heat, not less than 20 per cent., and not more than 30 per cent., of its weight.

Assay. *For silicon.* Digest about 0·5 gramme, accurately

weighed, with *hydrochloric acid*, maintaining the liquid just below the boiling-point and replacing the acid lost by evaporation. After about three hours digestion, evaporate to dryness, and heat for two hours at 105°; digest the residue on a water-bath for ten minutes with a mixture of 10 millilitres of *hydrochloric acid* and 10 millilitres of *water*; dilute with an equal volume of *water* and filter; transfer the residue to the filter, and wash with *water* until free from chloride. Recover any dissolved silica from the mixed filtrate and washings by evaporating to dryness on a water-bath, heating the residue for two hours at 105°, digesting this residue on a water-bath for ten minutes with a mixture of 5 millilitres of *hydrochloric acid* and 5 millilitres of *water*, diluting with 50 millilitres of *water*, transferring the insoluble matter to a filter, and washing with *water* until free from chloride. Dry, and ignite the two filter papers with their contents to constant weight, and weigh the residue of crude silica. Moisten the silica with 5 drops of *sulphuric acid* and 15 millilitres of *hydrofluoric acid*, heat cautiously on a sand-bath until all the acid has been driven off, ignite strongly, cool and weigh the residue. Deduct the weight of the residue from the weight of crude silica; the difference is the weight of pure SiO_2.

For magnesium. Evaporate to dryness the filtrate and washings, obtained in the Assay for silicon. Dissolve in 50 millilitres of *water*, add 20 millilitres of *solution of ammonium chloride*, 20 millilitres of *strong solution of ammonia*, and a slight excess of *solution of ammonium phosphate*; shake the mixture vigorously for half an hour, and allow it to stand for four hours; filter off the precipitate, and wash it with *dilute solution of ammonia*, diluted with four times its volume of *water*, until the washings are free from chloride: dry, ignite and weigh the residue. Each gramme of the residue is equivalent to 0·3622 gramme of MgO.

DOSES

Metric.	Imperial.
0·3 to 2 grammes.	5 to 30 grains.

MEL BORACIS

[Mel Borac.]

Honey of Borax

Glycerin may be replaced by an equal weight of Purified Honey in making this preparation.

MENTHOL

[Menthol.]

Menthol

Synthetic racemic menthol may be used. Synthetic racemic menthol complies with the following **Tests for Identity and Purity**:—*freezing-point*, 27° to 28° rising on prolonged stirring to 30° to 32°; *melting-point*, 32·5° to 34°; optically inactive. In all other respects it complies with the requirements of the British Pharmacopœia, 1932, and the Addendum, 1936.

MEPACRINÆ HYDROCHLORIDUM

[Mepacr. Hydrochlor.]

Mepacrine Hydrochloride

The statement of **DOSES** should read:—

Metric.	Imperial.
0·05 to 0·1 gramme.	$\frac{3}{4}$ to $1\frac{1}{2}$ grains.

MISTURA MAGNESII HYDROXIDI

[Mist. Mag. Hydrox.]

Mixture of Magnesium Hydroxide

British Pharmacopœia, 1932, page 285, *after* line 3, and preceding the formula, *insert*:—

A suitable preparation may be obtained by the following process:—

MISTURA SENNÆ COMPOSITA

[Mist. Senn. Co.]

Compound Mixture of Senna

Sodium Sulphate may be used, in place of Magnesium Sulphate, in making this mixture.

If crystals separate they should be redissolved by warming.

MORPHINÆ SULPHAS

[Morph. Sulph.]

Morphine Sulphate

$(C_{17}H_{19}O_3N)_2,H_2SO_4,5H_2O$. Mol. Wt. 758·5

Morphine Sulphate is the sulphate of an alkaloid morphine, obtained from opium. It contains not less than 74·0 per cent. and not more than 75·5 per cent. of anhydrous morphine.

Characters. White, acicular crystals or cubical masses or a white, crystalline powder; odourless; taste, bitter.

Soluble in 15·5 parts of *water* and in 565 parts of *alcohol (95 per cent.)* at 25°; insoluble in *ether* and in *chloroform*.

Tests for Identity. Sprinkle a little, previously powdered, on the surface of a drop of *nitric acid*; an orange-red colour is produced.

Add a little, previously powdered, to 1 millilitre of *sulphuric acid*, containing 1 drop of *solution of formaldehyde*; a purple colour is produced.

To 5 millilitres of a 3 per cent. w/v aqueous solution add 1 drop of *dilute solution of ammonia*; a crystalline precipitate is formed, which dissolves immediately on the addition of *test-solution of sodium hydroxide*.

To 5 millilitres of a 2 per cent. w/v aqueous solution add 1 drop of *test-solution of ferric chloride*; a blue colour is produced.

To a 2 per cent. w/v aqueous solution add *solution of potassium ferricyanide*, containing 1 drop per millilitre of *test-solution of ferric chloride*; an immediate bluish-green colour is produced (distinction from codeine).

To 0·02 gramme, dissolved in 5 millilitres of *N/10 sulphuric acid*, add 0·5 millilitre of a saturated solution of *potassium iodate* in *water*; an amber colour is produced, which reaches a maximum in about five minutes; on the addition of 0·5 millilitre of *strong solution of ammonia* the colour darkens almost to black (distinction from codeine and diamorphine).

Warm 0·1 gramme, dissolved in 2 millilitres of *sulphuric acid*, on a water-bath for fifteen minutes, cool, and add a few drops of *dilute nitric acid*; a blood-red colour is produced.

Yields the *reactions* characteristic of sulphates.

Tests for Purity. Wash the chloroform solution reserved from the first extraction in the Assay, with two successive quantities, each of 5 millilitres, of *water*; evaporate the chloroform solution to dryness on a water-bath; the residue weighs not more than 0·0075 gramme (limit of other alkaloids).

Dissolve 0·1 gramme in 2 millilitres of *sulphuric acid*; not more than a faint pink colour is produced (limit of readily carbonisable substances).

0·2 gramme loses, when dried at 120°, not more than 0·024 gramme and leaves, on incineration, not more than 0·0002 gramme of residue.

Assay. Transfer about 0·5 gramme, accurately weighed, to a separator, add 15 millilitres of *water*, 5 millilitres of *N/1 sodium hydroxide* and 10 millilitres of *chloroform*. Shake, allow to separate, and transfer the chloroform solution to another separator. Repeat the extraction with two further quantities, each of 10 millilitres, of *chloroform*. Wash the mixed chloroform solutions with 10 millilitres of *N/10 sodium hydroxide*, reserve the chloroform solution for the test for limit of other alkaloids, and add the alkaline solution to the first alkaline liquid. Add 20 millilitres of *alcohol* (*90 per cent.*), 40 millilitres of a mixture of three volumes of *chloroform* and one volume of *alcohol* (*90 per cent.*), and 1 gramme of *ammonium sulphate*. Shake well, allow to separate, and reserve the chloroform solution. Repeat the extraction with successive quantities of 30, 20, 20 and 20 millilitres of the chloroform-alcohol mixture. Wash each chloroform solution successively with two quantities, each of 5 millilitres, of *water*, avoiding vigorous shaking. Filter the chloroform solutions through a plug of cotton-wool, previously moistened with *chloroform*. Remove the solvent. Add 20 millilitres of *N/10 sulphuric acid*, boil, cool, and titrate the excess of acid with *N/10 sodium hydroxide*, using *tincture of cochineal* or *solution of methyl red* as indicator. Each millilitre of *N/10 sulphuric acid* is equivalent to 0·02852 gramme of anhydrous morphine.

Storage. Morphine Sulphate should be kept in a well-closed container protected from light.

Sterilisation of a Solution. A solution of Morphine Sulphate for parenteral injection is sterilised by *heating with a bactericide*, or by *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

DOSES

Metric.	Imperial.
0·008 to 0·02 gramme.	1/8 to 1/3 grain.

OLEUM HIPPOGLOSSI

[Ol. Hippogloss.]

Halibut-liver Oil

Second Addendum to the British Pharmacopœia, 1932, page 8, lines 14 to 17.

Tests for Purity. The statements of *acid value*, *iodine value*, *iodine value of glycerides*, and *unsaponifiable matter*, are changed to:—

"*acid value*, not greater than 6·0; *iodine value* (*pyridine bromide method*), not less than 112; *iodine value of glycerides*, 112 to 130 *unsaponifiable matter*, not less than 7 per cent."

OXYMEL SCILLÆ

[Oxymel. Scill.]

Oxymel of Squill

Indian Squill may be used, in place of Squill, in making this Oxymel.

PAMAQUINUM

[Pamaquin.]

Pamaquin

$C_{42}H_{44}O_7N_6$ . . . . Mol. Wt. 703·4

Pamaquin is the 6-methoxy-8-[ω-diethylamino-α-methylbutyl]-aminoquinoline salt of 2 : 2′-dihydroxy-1 : 1′-dinaphthylmethane-3 : 3′-dicarboxylic acid and may be prepared by the condensation of 2-chloro-5-diethylaminopentane with 6-methoxy-8-aminoquinoline and treating the base with 2 : 2′-dihydroxy-1 : 1′-dinaphthylmethane-3 : 3′-dicarboxylic acid. It contains not less than 43 per cent., and not more than 45 per cent., of 6-methoxy-8-[ω-diethylamino-α-methylbutyl]-aminoquinoline, and not less than 53 per cent., and not more than 57 per cent., of 2 : 2′-dihydroxy-1 : 1′-dinaphthylmethane-3 : 3′-dicarboxylic acid, both calculated with reference to the substance dried at 100° for two hours.

Characters. A yellow to orange-yellow powder; odourless; taste, bitter.

Insoluble in *water*; soluble in 10 parts of *acetone* containing 5 per cent. of *water*.

Tests for Identity. Dissolve 0·2 gramme in 5 millilitres of *acetone*, add 1 millilitre of *hydrochloric acid*; a precipitate is formed. Add 5 millilitres of *water*, filter, add 0·02 gramme of powdered *sodium iodate*, stir well and allow to stand; an intense violet colour suddenly appears after an interval of about two minutes.

To 0·02 gramme, finely powdered, add 2 millilitres of *sulphuric acid*, stir well, add 2 to 3 drops of *solution of formaldehyde*; a green colour gradually develops.

Tests for Purity. Dissolve 0·2 gramme in 5 millilitres of *acetone*, add 1 millilitre of a solution prepared by diluting *strong solution of ammonia* with half its volume of *water*; the colour of the solution is less intense than that of *N/250 iodine*.

Dissolve 0·355 gramme in 5 millilitres of *acetone*, add 1 millilitre of *hydrochloric acid* and 25 millilitres of *water*. Filter, wash well with three successive quantities, each of 5 millilitres,

of hot *water* and to the mixed filtrate and washings add, drop by drop, *test-solution of sodium hydroxide* until a slight permanent turbidity is obtained; add, drop by drop, *N/2 hydrochloric acid* until the solution just becomes clear, and dilute to 50 millilitres with *water*. To 5 millilitres add 5 millilitres of *water* and 1 millilitre of *N/1 hydrochloric acid*. Cool in ice and add 2 millilitres of a 3·5 per cent. w/v solution of *sodium nitrite* in *water*. Allow to stand for five minutes and add to a mixture of 5 millilitres of *solution of sodium carbonate* and 0·2 millilitre of an approximately 2 per cent. w/v solution of *disodium 2-naphthol-3 : 6-disulphonate* in *water*; mix well and allow to stand for ten minutes; the colour when viewed transversely in a tube is not deeper than that of a solution prepared by mixing together 15·0 millilitres of a solution containing 10·0 per cent. w/v of ferric chloride ($FeCl_3$) in *water*, 2·0 millilitres of a solution containing 10·0 per cent. w/v of copper sulphate ($CuSO_4$, $5H_2O$) in *water*, and 1·0 millilitre of *N/10 potassium permanganate*, viewed transversely in a similar tube (limit of 6-methoxy-8-aminoquinoline).

Loses, when dried at 100° for two hours, not more than 4 per cent. of its weight.

Moisten 1 gramme with *sulphuric acid*, ignite gently, again moisten with *sulphuric acid*, and re-ignite; the residue weighs not more than 0·002 gramme.

Assay. *For 6-methoxy-8-[ω-diethylamino-α-methylbutyl]-aminoquinoline.* Place about 0·5 gramme, accurately weighed, in a separator. Add 50 millilitres of *water*, 3 millilitres of *test-solution of sodium hydroxide* and 50 millilitres of *benzene*. Shake vigorously, allow to separate and remove the benzene solution. Repeat the extraction with two successive quantities, each of 20 millilitres, of *benzene*. Wash each benzene solution with the same 20 millilitres of *water*. Mix the benzene solutions, remove the benzene, dry the residue of 6-methoxy-8-[ω-diethylamino-α-methylbutyl]-aminoquinoline at 100° for one hour in an atmosphere of *nitrogen*, and weigh.

For 2:2′-dihydroxy-1:1′-dinaphthylmethane-3:3′-dicarboxylic acid. Warm the aqueous alkaline liquid from the Assay for 6-methoxy-8-[ω-diethylamino-α-methylbutyl]-aminoquinoline on the water-bath and add 2·4 millilitres of *hydrochloric acid*. Cool, collect the precipitated acid on a sintered glass filter, wash with *water* until the washings, after slightly acidifying with *nitric acid*, no longer give more than a slight opalescence with *solution of silver nitrate*, and dry the residue of 2:2′-dihydroxy-1:1′-dinaphthylmethane-3:3′-dicarboxylic acid at 105° to constant weight.

DOSES

Metric.	Imperial.
0·02 to 0·04 gramme.	1/3 to 2/3 grain.

NOTE.—See Notice Concerning Patents, page iv.

PARAFFINUM LIQUIDUM LEVE

[Paraff. Liq. Lev.]

Light Liquid Paraffin

Light Liquid Paraffin is a mixture of liquid hydrocarbons, obtained from petroleum.

Characters. A transparent, colourless, oily liquid, free from fluorescence by daylight; almost odourless when cold.

Insoluble in *water*, and in *alcohol (90 per cent.)*; soluble in *ether* and in *chloroform*; miscible with fixed and volatile oils.

Tests for Purity. *Specific gravity (15·5°/15·5°)*, 0·835 to 0·875, *kinematic viscosity*, not greater than 33·1 centistokes at 37·8°.

Mix 4 millilitres with 2 millilitres of *dehydrated alcohol* and 2 drops of a clear saturated solution of *lead monoxide* in *test-solution of sodium hydroxide*, and heat at 70° for ten minutes with frequent shaking; the mixture remains colourless (limit of sulphur compounds).

Boil 3 millilitres with 10 millilitres of *alcohol (90 per cent.)*; the alcohol is not acid to moistened *litmus paper* (limit of acidity).

PHENYLHYDRARGYRI NITRAS

[Phenylhydrarg. Nitras]

Phenylmercuric Nitrate

$C_{12}H_{11}O_4NHg_2$ . . . Mol. Wt. 634·3

Phenylmercuric Nitrate is basic phenylmercuric nitrate, C_6H_5HgOH, $C_6H_5HgNO_3$. It may be obtained by the interaction of a solution of nitrogen tetroxide in ice-cold chloroform, and a solution of diphenylmercury in ice-cold chloroform, and crystallisation of the compound from moist alcohol. It contains not less than 98 per cent. of $C_{12}H_{11}O_4NHg_2$.

Characters. White, lustrous plates, or a white, crystalline powder; odourless; taste, weakly metallic and astringent.

Very slightly soluble in *water*; soluble in about 160 parts of boiling *water*; soluble in about 1000 parts of *alcohol (95 per cent.)*; more soluble in *glycerin* and in fixed vegetable oils.

An aqueous solution is acid to *solution of methyl red*.

Tests for Identity. To 10 millilitres of a saturated solution in cold *water* add two drops of *solution of sodium sulphide*; a white precipitate is produced; boil the mixture and allow to stand; the precipitate becomes black.

Heat a mixture of 0·5 gramme with 0·5 gramme of *powdered zinc*, 0·5 gramme of *reduced iron*, and 5 millilitres of *test-solution of sodium hydroxide*; ammonia is evolved.

Heat a mixture of 0·05 gramme with 5 millilitres of *N/10 iodine*; remove the excess of iodine with *N/10 sodium thiosulphate*; a characteristic aromatic odour is produced.

Tests for Purity. *Melting-point*, the rate of rise of temperature being 5° per minute, 185° to 190° with decomposition.

Heat 0·1 gramme with 15 millilitres of *water*, cool, and filter; to the filtrate add two drops of *solution of sodium sulphide*; the resulting precipitate shows no immediate colour (limit of mercuric salts and heavy metals).

Loses, when dried over *sulphuric acid*, not more than 1 per cent. of its weight.

Assay. Boil a mixture of about 0·3 gramme, accurately weighed, with 10 millilitres of *hydrochloric acid* and 10 millilitres of *water* for one hour, in a flask fitted with a reflux condenser. Cool, dilute with 200 millilitres of *water*, and pass in *hydrogen sulphide* for fifteen minutes. Filter while hot through a Gooch crucible, wash the precipitate first with *solution of hydrogen sulphide*, then with *alcohol (95 per cent.)* and finally with *carbon disulphide*, dry at 110°, and weigh. Each gramme of precipitate is equivalent to 1·3631 grammes of $C_{12}H_{11}O_4NHg_2$.

PROFLAVINÆ SULPHAS

[Proflavin. Sulph.]

Proflavine Sulphate

Synonym. Proflavine.

$C_{13}H_{11}N_3,H_2SO_4$ . . . Mol. Wt. 307·19

Proflavine Sulphate is 2 : 8-diaminoacridine sulphate, and may be prepared by heating the stannichloride of 2 : 4 : 2′ : 4′-tetra-aminodiphenylmethane under pressure and converting the base into the sulphate. It contains not less than 98 per cent. of $C_{13}H_{11}N_3,H_2SO_4$, calculated with reference to the substance dried at 100°.

Characters. An orange-red to brownish-red, crystalline powder; odourless; taste, acid.

Soluble in about 300 parts of *water*; almost insoluble in *ether* and in *chloroform*; soluble in 10 parts of *glycerin*; almost insoluble in fixed and volatile oils and in *liquid paraffin*.

Tests for Identity. 0·1 gramme, dissolved in 30 millilitres of *water*, forms a deep orange-coloured solution, which responds to the following tests:—

A few drops produce a greenish fluorescence when added to a large volume of *water*.

1 millilitre yields an immediate precipitate of bright reddish-orange prismatic needles on the addition of 2 drops of *sulphuric acid*.

2 millilitres yields a lemon-yellow precipitate on the addition of *test-solution of sodium hydroxide*.

5 millilitres gives a brownish precipitate on the addition of a few drops of *solution of formaldehyde* and 2 drops of a 10 per cent. w/v *solution of sodium nitrite* in *water*. When the mixture is allowed to stand for five minutes and filtered, the filtrate is colourless (distinction from acriflavine).

Yields the *reactions* characteristic of sulphates.

Tests for Purity. 1 gramme dissolved in 250 millilitres of *water* at 35°, forms a clear solution, which remains clear and free from sediment on standing in the dark at 15° to 20° for twenty-four hours.

Dissolve 0·2 gramme in 100 millilitres of *water* at 50°, cool to 20°, add 0·9 gramme of *sodium chloride*, dissolve and allow to stand in the dark at 15° to 20° for twenty-four hours; the solution remains clear and free from sediment.

Loses, when dried at 100°, not more than 10 per cent. of its weight.

Moisten 1 gramme with *sulphuric acid*, ignite gently, again moisten with *sulphuric acid*, and re-ignite; the residue weighs not more than 0·01 gramme.

Assay. Dissolve about 2 grammes, accurately weighed, in 750 millilitres of *water*. Add sufficient *N/1 hydrochloric acid* to render the solution faintly acid to *congo-red paper*, and add 5 grammes of *sodium acetate*. Add 50 millilitres of *M/10 potassium ferricyanide*, stirring during the addition, set aside for ten minutes, filter through a Buchner funnel and wash the precipitate on the filter with three successive quantities of 50 millilitres of *water*. To the mixed filtrate and washings add in succession 10 millilitres of *hydrochloric acid*, 10 grammes of *sodium chloride*, 1 gramme of *potassium iodide* and 3 grammes of *zinc sulphate* dissolved in 10 millilitres of *water*, mixing after each addition. Allow to stand for three minutes and titrate the liberated iodine with *N/10 sodium thiosulphate*, using *mucilage of starch* as indicator. When the titration is nearly complete, allow to stand for a further three minutes, and then complete the titration. Repeat the operation without the proflavine. The difference between the two titrations represents the amount of potassium ferricyanide required to precipitate the proflavine. Each millilitre of *M/10 potassium ferricyanide* is equivalent to 0·09216 gramme of $C_{13}H_{11}N_3,H_2SO_4$.

SCILLA

[Scill.]

Squill

When Squill is prescribed, or demanded, Indian Squill may be dispensed, or supplied.

SODII LACTAS

[Sod. Lact.]

Sodium Lactate (70 per cent.)

$CH_3 \cdot CHOH \cdot COONa$. . . Mol. Wt. 112·04

Sodium Lactate (70 per cent.) may be prepared by addition of sodium hydroxide or sodium carbonate to a hot dilute solution of lactic acid, and subsequent concentration. It contains 70 per cent. w/w of $C_3H_5O_3Na$ (limits, 68 to 72), and about 30 per cent. w/w of water.

Characters. A clear, colourless to pale yellow, viscous liquid, at ordinary temperature; on cooling it forms a mass of moist, colourless to pale yellow crystals; odour, slight; taste, saline.

Soluble in *water*, in *alcohol* (*90 per cent.*) and in *glycerin*; insoluble in *ether*, in *chloroform*, and in fixed oils.

Tests for Identity. Acidify about 1 gramme with *dilute sulphuric acid*, add about 0·1 gramme of *potassium permanganate* and heat gently; acetaldehyde, recognisable by its odour, is evolved.

Yields the *reactions* characteristic of sodium.

Tests for Purity. A solution in boiled and cooled *water* does not become pink on the addition of a few drops of *solution of phenolphthalein*.

Dissolve 1 gramme in 10 millilitres of *water*, add 5 millilitres of *solution of potassio-cupric tartrate*, and boil; not more than the slightest trace of a red precipitate is produced (limit of various sugars).

1 gramme complies with the *limit test for sulphates*.

0·1 gramme complies with the *limit test for chlorides*.

Arsenic limit, 5 parts per million. *Lead limit*, 10 parts per million.

Assay. Heat, until carbonised, about 3 grammes, accurately weighed; cool, and boil the residue with 50 millilitres of *water* and 50 millilitres of *N/2 sulphuric acid*; filter and wash the filter with *water*; titrate the excess of acid in the filtrate and washings with *N/2 sodium hydroxide*, using *solution of methyl orange* as indicator. Each millilitre of *N/2 sulphuric acid* is equivalent to 0·05602 gramme of $C_3H_5O_3Na$.

Preparation. Cataplasma Kaolini.

SODII METABISULPHIS

[Sod. Metabisulphis]

Sodium Metabisulphite

$Na_2S_2O_5$ . . . . . Mol. Wt. 190·1

Sodium Metabisulphite may be prepared by saturating a solution of sodium hydroxide with sulphur dioxide and

allowing to crystallise. It contains not less than 90 per cent. of $Na_2S_2O_5$.

Characters. Colourless prismatic crystals or a white powder, which may become yellowish on keeping; odour, sulphurous; taste, acid and saline. On exposure to air and moisture it effloresces and is slowly oxidised to sulphate.

Soluble in about 2 parts of *water*; less soluble in *alcohol (95 per cent.)*.

Tests for Identity. An aqueous solution is acid to *solution of litmus* and has the odour of sulphur dioxide.

An aqueous solution decolourises *solution of iodine*, and the resulting solution yields the *reactions* characteristic of sulphates.

Yields the *reactions* characteristic of sodium.

Tests for Purity. A 10 per cent. w/v solution in *water* remains clear when acidified with *hydrochloric acid* (absence of thiosulphate).

Arsenic limit, 5 parts per million. *Lead limit*, 20 parts per million.

Assay. Dissolve about 0·2 gramme, accurately weighed, in 50 millilitres of *N/10 iodine*; add 1 millilitre of *hydrochloric acid* and titrate the excess of iodine with *N/10 sodium thiosulphate*. Each millilitre of *N/10 iodine* is equivalent to 0·004753 gramme of $Na_2S_2O_5$.

Storage. Sodium Metabisulphite should be stored in a well-closed container.

SODII MORRHUAS

[Sod. Morrh.]

Sodium Morrhuate

Sodium Morrhuate is a mixture of sodium salts of fatty acids obtained from cod-liver oil. It may be produced by the hydrolysis of cod-liver oil with sodium hydroxide.

Characters. Light brown granules or powder. Odour, slightly fishy but not rancid; taste, slightly acrid.

Soluble in *water*, more soluble in warm *water*; almost completely soluble in *alcohol (90 per cent.)*.

Tests for Purity. 1 gramme dissolves completely in 10 millilitres of warm *water*, forming a clear solution.

Dissolve 2·5 grammes in 50 millilitres of boiling *alcohol (95 per cent.)*, previously neutralised to *solution of phenolphthalein*, filter while hot and wash the filter thoroughly with boiling neutralised *alcohol (95 per cent.)*; the mixed filtrate and washings requires for neutralisation not more than 0·2 millilitre of *N/10 sulphuric acid* and not more than 1 millilitre of *N/10 sodium hydroxide*, *solution of phenolphthalein* being used as indicator (limit of alkali hydroxide or of free fatty acid).

Wash the filter with hot *water*, cool and titrate the washings with *N/10 sulphuric acid*, using *solution of methyl orange* as indicator; not more than 5 millilitres is required (limit of alkali carbonate).

Dissolve 3 grammes in 50 millilitres of recently boiled and cooled *water*, add 50 millilitres of *ether*, acidify with 10 millilitres of *dilute hydrochloric acid*, shake and allow to separate; no resinous matter appears between the two layers (limit of oxidised fatty acids).

Separate the ethereal layer, wash with two quantities, each of 5 millilitres, of *water*, evaporate and dry the residual fatty acids in a current of *nitrogen*; the *iodine value* of the fatty acids is 140 to 175.

Storage. Sodium Morrhuate should be kept in a well-closed container, protected from light, and stored in a cool place.

Preparation. Injectio Sodii Morrhuatis.

SODII SULPHAS EXSICCATUS

[Sod. Sulph. Exsicc.]

Exsiccated Sodium Sulphate

Synonyms. Anhydrous Sodium Sulphate: Exsiccated Glauber's Salt.

Na_2SO_4. . . . . Mol. Wt. 142·1

Exsiccated Sodium Sulphate may be prepared by drying Sodium Sulphate at 100° until it ceases to lose weight. It contains not less than 99 per cent. of Na_2SO_4, calculated with reference to the salt dried at 100°.

Characters. A white, hygroscopic powder; odourless; taste bitter and saline.

Soluble in 8 parts of *water*.

Tests for Identity. Yields the *reactions* characteristic of sodium, and of sulphates.

Tests for Purity. *Arsenic limit*, 4 parts per million. *Lead limit*, 10 parts per million.

Loses, when dried at 100°, not more than 5 per cent. of its weight.

Complies with the other Tests for Purity described under 'Sodii Sulphas' when two-fifths of the stated quantity is taken for each test.

Assay. Carry out the Assay as described under 'Sodii Sulphas', using about 0·3 gramme, accurately weighed. Each gramme of the residue is equivalent to 0·6086 gramme of Na_2SO_4.

Storage. Exsiccated Sodium Sulphate should be stored in a well-closed container.

DOSES

Metric.	Imperial.
1 to 8 grammes.	15 to 120 grains.

SULPHANILAMIDUM

[Sulphanilamid.]

Sulphanilamide

$NH_2 \cdot C_6H_4 \cdot SO_2NH_2$ [$NH_2 : SO_2NH_2 = 1 : 4$]

Mol. Wt. 172·1

Sulphanilamide is *p*-aminobenzenesulphonamide and may be prepared by hydrolysis of the amide of acetylsulphanilic acid with hydrochloric acid, followed by decomposition of the resulting hydrochloride with alkali. It contains not less than 99·0 per cent., and not more than the equivalent of 100·5 per cent., of $C_6H_8O_2N_2S$, calculated with reference to the substance dried in vacuo at 100°.

Characters. Colourless crystals or a white crystalline powder; odourless; taste, slightly bitter with a sweet aftertaste.

Soluble in 250 parts of *water* at 15·5°, in 170 parts of *water* at 20°, in 115 parts of *water* at 25°, sparingly soluble in *alcohol (95 per cent.)*. Insoluble in *ether*, in *chloroform* and in *benzene*.

Tests for Identity. Heat about 0·01 gramme in a dry tube; an intense violet-blue colour is produced and on further heating the odours of aniline and of ammonia are recognisable.

Dissolve about 0·05 gramme in 2 millilitres of warm *dilute hydrochloric acid*; cool in ice and add 2 millilitres of a 1 per cent. w/v solution of *sodium nitrite* in *water*; add 2 millilitres of *water* and 1 millilitre of *solution of β-naphthol*; an orange precipitate is produced.

Tests for Purity. Melting-point, 164·5° to 166·5°.

A saturated aqueous solution is neutral to *solution of litmus*.

1 gramme dissolves completely in 10 millilitres of *dilute hydrochloric acid*.

1 gramme dissolves completely in 5 millilitres of a 10 per cent. w/v solution of *sodium hydroxide* in *water*.

Boil 0·25 gramme with 5 millilitres of *test-solution of sodium hydroxide*; no ammonia is evolved (absence of ammonium salts).

1 gramme complies with the *limit test for chlorides* and with the *limit test for sulphates*.

Arsenic limit, 1 part per million. *Lead limit*, 5 parts per million.

1 gramme loses, when dried in vacuo at 100°, not more than 0·01 gramme; and leaves, on incineration, not more than 0·0005 gramme of residue.

Assay. Dissolve in *water*, by boiling, about 0·4 gramme, accurately weighed. Cool, and add sufficient *water* to produce 100 millilitres. Transfer 25 millilitres of the solution to a 250-millilitre glass-stoppered flask; add 30 millilitres of *N/10 bromine* and 5 millilitres of *hydrochloric acid*, and shake occasionally during fifteen minutes. Add 20 millilitres of *solution of potassium iodide*, shake thoroughly and titrate with *N/10 sodium thiosulphate*, using *mucilage of starch* as indicator. Each millilitre of *N/10 bromine* is equivalent to 0·0043 gramme of $C_8H_8O_3N_2S$.

DOSES

Metric.	Imperial.
0·5 to 1 gramme.	8 to 15 grains.

SURAMINUM

[Suramin.]

Suramin

$C_{51}H_{34}O_{23}N_6S_6Na_6$ . . Mol. Wt. 1428·6

Suramin is the symmetrical urea of the sodium salt of *m*-benzoyl-*m*-amino-*p*-methylbenzoyl-1-aminonaphthalene-4 : 6 : 8-trisulphonic acid. It may be prepared by condensing 1-naphthylamine-4 : 6 : 8-trisulphonic acid with *m*-nitro-*p*-methylbenzoyl chloride, reducing the product, condensing with *m*-nitrobenzoyl chloride, again reducing and finally treating with carbonyl chloride.

Characters. A white or faintly cream-coloured powder; odourless; taste, alkaline and slightly bitter.

Freely soluble in *water*; only slightly soluble in *alcohol (95 per cent.)*; insoluble in *ether*, in *chloroform*, and in *benzene*.

Test for Identity. Boil 0·05 gramme with 2 millilitres of a mixture of equal volumes of *sulphuric acid* and *water* for five minutes, cool and add 20 millilitres of *water* and 0·02 gramme of *sodium nitrite*, allow to stand for one minute, add 0·2 gramme of *urea* and shake well; after two minutes add 0·2 millilitre of this solution to a solution of 0·01 gramme of *α-naphthylamine* and 0·5 gramme of *sodium acetate* in 5 millilitres of *acetic acid*; a magenta colour rapidly develops.

Tests for Purity. Dissolve 1 gramme in 100 millilitres of recently boiled and cooled *water*; not more than a minute trace is left undissolved, the solution is clear and its reaction is not less than *p*H 6·2 and not more than *p*H 6·8, *bromothymol blue* being used as indicator.

Dissolve 0·5 gramme in 10 millilitres of *water*, add 5 millilitres of *dilute nitric acid* and 5 millilitres of *N/10 silver nitrate*, filter, wash with *water*, and titrate the filtrate and washings with *N/10 ammonium thiocyanate*, using *solution of ferric ammonium sulphate* as indicator; not less than 3·3 millilitres of *N/10 ammonium thiocyanate* is required (limit of chloride).

Dissolve 0·5 gramme in 10 millilitres of *water*, add 1 millilitre of *solution of barium chloride* and allow to stand for five minutes; no turbidity is produced (limit of sulphate).

Dissolve 5 grammes in 300 millilitres of *water*, add 5 millilitres of *hydrochloric acid* and titrate at 15° to 20° with *N/10 sodium nitrite*, using *starch iodide paper* as external indicator. Repeat the operation without the suramin. The difference between the two titrations does not exceed 0·4 millilitre (limit of free amine).

Arsenic limit, 2 parts per million. *Lead limit*, 15 parts per million.

Loses, when dried at 100°, not more than 14 per cent. of its weight.

Test for Absence of Undue Toxicity. For toxicity it is tested on at least ten mice by the injection of doses of 0·3 milligram per gramme of body weight given intravenously. It passes the test, if the total number of mice which die within three days does not exceed 50 per cent. of the total number of mice injected. The test may be carried out as follows. A 2·5 per cent. w/v solution of the sample being tested is prepared in freshly distilled *water*. Each of a group of ten mice receives by intravenous injection a dose of 0·012 millilitre per gramme of body weight. If not more than five die within three days, the sample passes the test. If more than five die, a second series of twenty mice receive similar injections. If the total number of mice which have died in the two series within three days from the date of injection in each case is not greater than fifteen, the sample passes the test; if the number is greater than fifteen, the sample fails to pass the test.

Test for Therapeutic Potency. For therapeutic potency, it is tested on mice infected with a strain of *Trypanosoma equiperdum*, or other suitable species of trypanosome sensitive to suramin. The sample is tested on at least ten mice by intravenous injection of doses of 0·8 microgram per gramme of body weight. On the third day after the administration of the suramin, the blood of each mouse is examined in twenty fields of a microscope with a 1/6 inch objective. The sample passes the test, if 50 per cent. or more of the total number of mice

injected show absence of visible trypanosomes in the blood. The test may be carried out as follows. Mice are inoculated with the trypanosomes. After forty-eight hours the blood of each mouse is examined microscopically, and an estimate of the density of the infection in the blood of each mouse is made by examining a film of the blood, in the form of a thin cover-slip preparation, and counting the trypanosomes in at least ten microscopical fields, each having an area of 0·12 square millimetre. The number of trypanosomes in each two fields should be between 1 and 20.

Ten of the infected mice then receive 0·016 millilitre of a 0·005 per cent. w/v solution in freshly distilled *water* per gramme of body weight, the injections being made into a vein. The blood of each mouse is examined microscopically on the first and third days following. If no trypanosomes are found in the blood of five or more mice when twenty fields of a microscope, as described above, are examined on the third day, the sample passes the test. If trypanosomes are found under these conditions in the blood of more than five mice, the test may be repeated. The sample passes the test, if no trypanosomes are found under these conditions in the blood of not less than 50 per cent. of the total number of mice treated.

Storage. Suramin should be kept in a closed container, protected from light, and stored in a cool place.

Sterilisation of a Solution. Suramin is prepared in sterile solution for parenteral injection by dissolving it in the requisite amount of Physiological Solution of Sodium Chloride immediately before use.

DOSES

By intravenous injection.

Metric.	Imperial.
1 to 3 grammes.	15 to 45 grains.

SYRUPUS PRUNI SEROTINÆ

[Syr. Prun. Serot.]

Syrup of Wild Cherry

Synonyms. Syrupus Pruni Virginianæ: Syrup of Virginian Prune.

This Syrup may be made according to the following modified formula.

Wild Cherry Bark, in *moderately coarse powder*	150	grammes
Tragacanth, finely powdered	7	grammes
Chloroform	5	millilitres
Alcohol (90 per cent.)	20	millilitres
Soluble Saccharin	1·6	grammes
Distilled Water, sufficient to produce	1000	millilitres

Moisten the Wild Cherry Bark with 100 millilitres of Distilled Water; set aside for twenty-four hours in a closed vessel; pack in a percolator and percolate with Distilled Water until 450 millilitres of percolate are obtained. Dilute the percolate to 950 millilitres with Distilled Water and add the Soluble Saccharin. Mix the Tragacanth with a mixture of the Chloroform and Alcohol (90 per cent.) in a dry bottle; add, as quickly as possible, the diluted percolate containing the Soluble Saccharin, and shake vigorously; add sufficient Distilled Water to produce the required volume, and mix thoroughly.

TINCTURA CARDAMOMI COMPOSITA

[Tinct. Cardam. Co.]

Compound Tincture of Cardamom

Glycerin may be omitted in making this Tincture.

TINCTURA IPECACUANHÆ

[Tinct. Ipecac.]

Tincture of Ipecacuanha

Glycerin may be omitted in making this Tincture.

TINCTURA RHEI COMPOSITA

[Tinct. Rhei Co.]

Compound Tincture of Rhubarb

Glycerin may be omitted in making this Tincture.

TINCTURA SCILLÆ

[Tinct. Scill.]

Tincture of Squill

Indian Squill may be used, in place of Squill, in making this Tincture.

TINCTURA VALERIANÆ AMMONIATA

[Tinct. Valerian. Ammon.]

Ammoniated Tincture of Valerian

Indian Valerian may be used, in place of Valerian, in making this Tincture.

UNGUENTUM ACIDI TANNICI

[Ung. Acid. Tann.]

Ointment of Tannic Acid

Synonym. Tannic Acid Ointment.

This Ointment may be made according to the following modified formula.

Tannic Acid	200 grammes
Distilled Water . . .	200 millilitres
Wool Fat	200 grammes
Hard Paraffin	100 grammes
Yellow Soft Paraffin . .	300 grammes

Dissolve the Tannic Acid in the Distilled Water; mix the solution with the Wool Fat by trituration in a warm mortar. Melt together the Hard Paraffin and the Yellow Soft Paraffin, and incorporate with the mixture of the solution of Tannic Acid and Wool Fat; stir until cold.

UNGUENTUM HAMAMELIDIS

[Ung. Hamam.]

Ointment of Hamamelis

Liquid Extract of Hamamelis .	10 millilitres
Wool Fat	50 grammes
Yellow Soft Paraffin . .	40 grammes

Mix by trituration in a warm mortar.

In making Ointment of Hamamelis the Liquid Extract of Hamamelis may be replaced by a liquid extract of hamamelis prepared with Industrial Methylated Spirit, suitably diluted, provided that the law and the statutory regulations governing the use of Industrial Methylated Spirit are observed.

UNGUENTUM HYDRARGYRI

[Ung. Hydrarg.]

Ointment of Mercury

Ointment of Mercury contains Mercury equivalent to 30 per cent. of Hg (limits, 29 to 31).

Mercury	300 grammes
Suet	50 grammes
Benzoinated Lard . . .	650 grammes

Triturate the Mercury with the Suet and 50 grammes of the Benzoinated Lard, until metallic globules cease to be visible when examined under a lens magnifying four diameters; incorporate the remainder of the Benzoinated Lard.

A suitable quantity of White Beeswax may be used, in place of an equal weight of Benzoinated Lard, in making this ointment, in order to produce an ointment of the required consistence.

Assay. Boil gently for five minutes about 1 gramme, accurately weighed, in 10 millilitres of *nitric acid* and 25 millilitres of *water*; cool, and dilute with 25 millilitres of *water*. Decant the acid solution on to a moistened filter paper, filter, and wash the melted fat several times with small quantities of hot *water*. To the warm mixture of filtrate and washings add sufficient *solution of potassium permanganate* to produce a permanent pink colour. Decolourise by the addition of a trace of *ferrous sulphate*, and titrate with *N/10 ammonium thiocyanate*, using *solution of ferric ammonium sulphate* as indicator. Each millilitre of *N/10 ammonium thiocyanate* is equivalent to 0·01003 gramme of Hg.

Preparations. Unguentum Hydrargyri Compositum.
Unguentum Hydrargyri Dilutum.

See Note under 'Unguentum Hydrargyri Dilutum'.

UNGUENTUM HYDRARGYRI DILUTUM

[Ung. Hydrarg. Dil.]

Dilute Ointment of Mercury

Dilute Ointment of Mercury contains Mercury equivalent to 10 per cent. of Hg (limits, 9·5 to 10·5).

Ointment of Mercury . .	333·3 grammes
Simple Ointment . . .	666·7 grammes

Mix by trituration.

Assay. Carry out the Assay as directed under 'Unguentum Hydrargyri', using about 3 grammes, accurately weighed. Each millilitre of *N/10 ammonium thiocyanate* is equivalent to 0·01003 gramme of Hg.

NOTE.—When 'Mercury Ointment,' 'Mercurial Ointment,' or 'Blue Ointment' is prescribed or demanded, Dilute Ointment of Mercury shall be dispensed or supplied, unless, on enquiry, it is ascertained that Ointment of Mercury is required.

URETHANUM

[Urethan.]

Urethane

$NH_2 \cdot COOC_2H_5$ . . . Mol. Wt. 89·06

Urethane is ethyl carbamate and may be prepared by the action of ammonia on ethyl chloroformate.

Characters. Colourless, prismatic crystals or leaflets; odourless; taste, cooling, saline and slightly bitter.

Soluble in 2 parts of *water*, in 1 part of *alcohol (95 per cent.)* and in *ether*, in *chloroform*, in *glycerin* and in fixed oils.

Tests for Identity. Heat with *solution of potassium hydroxide*; ammonia is evolved.

Heat gently with *sulphuric acid*; carbon dioxide is evolved.

Dissolve 0·5 gramme in 5 millilitres of *water*, add 1 gramme of *sodium carbonate* and 0·01 gramme of *iodine* and warm; yellow crystals of iodoform separate on cooling.

Tests for Purity. *Melting-point*, 48° to 50°, after drying over *sulphuric acid* in a desiccator.

Dissolve 1 gramme in 2 millilitres of *water* and add 1 millilitre of *nitric acid*; no precipitate is produced (absence of urea).

1 gramme complies with the *limit test for chlorides*.

1 gramme leaves, on incineration, not more than 0·0005 gramme of residue.

Preparation. Injectio Quininae et Urethani.

DOSES

Metric.	Imperial.
1 to 2 grammes.	15 to 30 grains.

URGINEA

[Urgin.]

Indian Squill

Indian Squill is the bulb of *Urginea indica* Kunth., divested of its dry membranous outer scales, cut into slices, and dried.

Characters. Slightly curved, buff or pale greyish-yellow, somewhat translucent, strips, cut longitudinally or transversely, from 1 to 5 centimetres long and 3 to 5 millimetres thick, frequently tapering towards both ends, and sometimes united in groups of about four to eight; tough and slightly flexible when moist, but brittle and easily fractured when dry. Epidermis of polygonal tabular cells and occasional stomata; mesophyll, parenchymatous and mucilaginous, with numerous scattered cells containing bundles of acicular crystals of calcium oxalate not embedded in mucilage; vascular strands, with slender spiral vessels, traversing the tissues longitudinally at intervals; starch absent. Odour, slight; taste, bitter, mucilaginous and acrid.

Test for Purity. *Ash*, not more than 6 per cent.

Storage. Powdered Indian Squill is very hygroscopic and should be kept in a desiccated atmosphere.

DOSES

Metric.	Imperial.
0·06 to 0·2 gramme.	1 to 3 grains.

VALERIANA

[Valerian.]

Valerian

When Valerian is prescribed, or demanded, Indian Valerian may be dispensed, or supplied.

VALERIANA INDICA

[Valerian. Indic.]

Indian Valerian

Indian Valerian consists of the dried rhizome and roots of *Valeriana Wallichii* DC. It contains not more than 2 per cent. of other organic matter.

Characters. Rhizome, in pieces about 4 to 8 centimetres long and 5 to 10 millimetres thick, sub-cylindrical and dorsiventrally somewhat flattened, usually slightly curved and unbranched; upper surface, marked with raised encircling leaf scars, under surface bearing numerous small circular prominent root scars and a few stout rootlets, the crown bearing the remains of petioles; dull yellowish-brown externally; fracture short and horny; transversely cut surface showing a dark cortex about 1 millimetre wide, a well-marked cambium line, a diffuse ring of about 12 to 15 pale xylem bundles separated by dark medullary rays, and a large dark pith about 3 to 6 millimetres in diameter; periderm, consisting of a phellogen and of several layers of tabular, thin-walled cork cells; cortex, medullary rays and pith, composed of rounded parenchymatous cells containing abundant starch in single or, occasionally, compound grains of 2 components, individual grains being from 7 to 30, mostly 10 to 25, microns in diameter, with numerous resin cells; endodermal cells, empty and collapsed, with a well-marked, lignified casparian strip; calcium oxalate absent. Roots, few, about 6 to 7 centimetres long and about 1 to 2 millimetres thick, with a wide, dark coloured bark and a pale central woody core. Odour, strong and reminiscent of *iso*-valeric acid; taste, bitter and somewhat camphoraceous.

Test for Purity. *Ash*, not more than 12 per cent.

DOSES

Metric.	Imperial.
0·3 to 1 gramme.	5 to 15 grains.

APPENDICES

APPENDICES

APPENDIX I

MATERIALS AND SOLUTIONS EMPLOYED IN TESTS

Add the following reagents :—

Cyanogen Bromide, Solution of : Add, drop by drop, a 10 per cent. w/v solution of *potassium cyanide* in *water* to *solution of bromine* until the colour disappears.

Solution of Cyanogen Bromide must be freshly prepared.

Disodium 2-Naphthol-3 : 6-disulphonate : of Reagent purity.

Hydrofluoric Acid : a 40 per cent. w/v solution of HF in *water*, of Reagent purity.

α-Naphthylamine : of Reagent purity.

Nitrogen : N_2, washed and dried.

Sodium Hydroxide, Test-solution of :—a 20 per cent. w/v solution of *sodium hydroxide* in *water*.

Sodium Iodate : $NaIO_3$ of Reagent purity.

Urea : of the British Pharmacopœia.

Zinc Sulphate : of the British Pharmacopœia.

British Pharmacopœia, page 509, lines 3 and 4 :—

Sodium Hydroxide, Solution of :

delete this reagent.

In the British Pharmacopœia, 1932, and Addenda :—

For *solution of sodium hydroxide* read *test-solution of sodium hydroxide*

APPENDIX II

A. *SOLUTIONS EMPLOYED IN VOLUMETRIC DETERMINATIONS*

Add the following solutions :—

Solution of Hydrochloric Acid, N/20.

for N/20 . . . . 1·823 grammes HCl

Solution of Iodine, N/250.

for N/250 . 0·5078 gramme I and 0·72 gramme KI

Solution of Potassium Ferricyanide, M/10.

for M/10 . . . 32·92 grammes $K_3Fe(CN)_6$

Solution of Sodium Nitrite, N/10.

for N/10 . . . . 6·901 grammes $NaNO_2$

APPENDIX IV

A. *DETERMINATION OF FREEZING-POINT, OF MELTING-POINT, AND OF SOLIDIFYING-POINT*

METHOD IV.

Add the following: *Benzyl Benzoate.*

F. *DETERMINATION OF VISCOSITY*

British Pharmacopœia, 1932, pages 539–540, and Addendum, 1936, to the British Pharmacopœia, 1932, pages 79–81, *delete* this section;
insert

F. *DETERMINATION OF VISCOSITY*

The dynamic viscosity (η) of a liquid in units of the centimetre-gramme-second system is the tangential force in dynes per square centimetre exerted on two parallel planes, placed 1 centimetre apart in the liquid, when one of the planes is moving in its own plane with a velocity of 1 centimetre per second relatively to the other. The unit of dynamic viscosity on the centimetre-gramme-second system, the poise, is the dynamic viscosity of a liquid in which the force between the two planes is 1 dyne per square centimetre. The centipoise is one-hundredth of a poise.

The kinematic viscosity (ν) of a liquid is the quotient obtained by dividing the dynamic viscosity by the density of the liquid. The unit of kinematic viscosity on the centimetre-gramme-second system, the stokes, is the kinematic viscosity of a liquid which has a dynamic viscosity of 1 poise and a density of 1 gramme per cubic centimetre.[1] The centistokes is one-hundredth of a stokes.

Viscosity is determined by means of a glass viscometer of the type shown in the figure, and constructed in accordance with the dimensions shown in the table. The specification of the apparatus and method of procedure is in agreement with the British Standard Specification No. 188, 1937.[2]

[1] In actual determinations densities expressed in grammes per millilitre may be employed, since the difference between the cubic centimetre and the millilitre is too small to affect the results significantly.

[2] Acknowledgements are made to the British Standards Institution for permission to use material contained in this Specification.

DIMENSIONS OF VISCOMETERS

All linear dimensions are given in centimetres.
All volumes are given in millilitres.

	Viscometers suitable for Light Liquid Paraffin.	Viscometers suitable for Liquid Paraffin.	Viscometers suitable for a 3 per cent. solution of Pyroxylin in Acetone.
Range (centistokes) . . .	5 to 40	30 to 250	200 to 1500
Capillary (de)—			
Length, ± 5 per cent. .	10	10	10
Internal diameter, ± 10 per cent.	0·115	·23	0·38
Tube (aB)—			
Length, ± 5 per cent. .	7·0	7·0	7·0
Internal diameter, ± 10 per cent.	0·40	0·7	0·7
Bulb (BC)—			
External diameter, ± 10 per cent.	2·1	2·8	3·4
Capacity, ± 5 per cent. .	5·5	16·0	26·0
Bulb (Cd)—Capacity ± 10 per cent.	0·4	1·2	1·4
Bent tube (ef)—Minimum internal diameter . .	0·5	0·7	0·8
Tube (Gh)—Internal diameter, ± 10 per cent. .	0·5	0·7	0·8
Bulb (fG)—			
External diameter, ± 10 per cent.	2·1	2·8	3·4
Minimum capacity . .	7·0	20	30
Dimension *x*— ± 10 per cent.	5·5	5·5	7·0
Distance between vertical axes— ± 10 per cent. .	1·5	2·0	2·5

METHOD OF PROCEDURE.—The viscometer is filled with the liquid to be tested through the arm hG so that the level in this arm stands within 0·2 millimetre of the mark G when the capillary is vertical and the specified temperature has been attained. The liquid is sucked, or blown, up to a point 1 centimetre above B, and the time taken for the meniscus to fall from mark B to mark C is measured.

The constant (K) of the instrument is determined in centistokes per second by observations on a liquid of known kinematic viscosity.

The kinematic viscosity is calculated from the equation

$$\nu = Kt$$

where ν = kinematic viscosity in centistokes

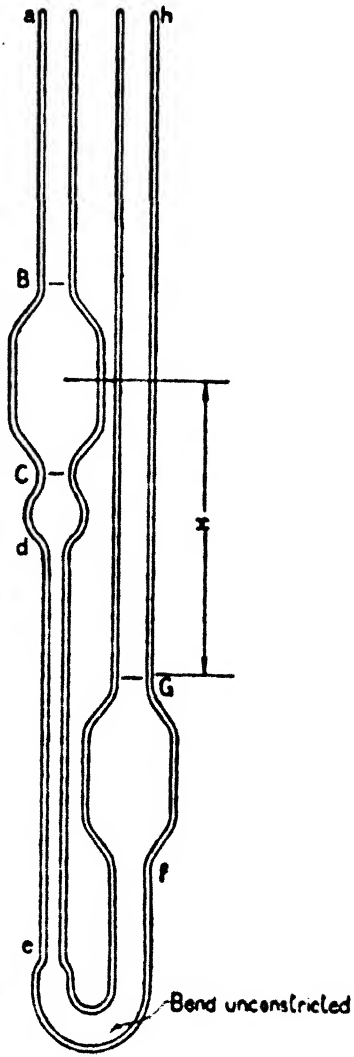
t = time in seconds for the meniscus to fall from B to C.

The dynamic viscosity is calculated from the equation

$$\eta = \nu\rho$$

where η = dynamic viscosity in centipoises

ρ = weight in grammes of 1 millilitre of the liquid at the temperature of the test.



B, C and G are etched markings and should extend round the tube.

a, d, e, f and h are for explanatory purposes only and do not appear on the viscometer.

APPENDIX VI

QUANTITATIVE TEST FOR LEAD

In the Tables, British Pharmacopœia, 1932, pages 553 to 558, insert :—

Acidum Mandelicum . .	7 [a]	5	2 [a]	5	2·5	5
Acidum Nicotinicum . .	7 [a]	5	2 [a]	5	5	10
Magnesii Trisilicas . . .	3·5 [j]	—	1 [j]	—	5	10
Sodii Lactas	12	5	2	5	10	10
Sodii Metabisulphis . . .	7	15	2	5	10	20
Sodii Sulphas Exsiccatus .	7	5	2	5	5	10
Sulphanilamidum . . .	2 [b]	—	1 [b]	—	0·5	5
Suraminum	4 [d]	—	—	—	6	15

[a] Solution effected by the addition of *solution of ammonia PbT.*

[b] Test carried out by adding to each solution 7 millilitres of *solution of sodium hydroxide PbT.*, 1 millilitre of *solution of potassium cyanide PbT.* and 2 drops of *solution of sodium sulphide PbT.*

[d] Primary solution prepared as follows :—Heat 4·0 grammes with 8 millilitres of *water* and 5 millilitres of *nitric acid PbT.* in a round-bottomed flask until the first reaction has subsided, cool, add 2·5 millilitres of *sulphuric acid PbT.* and heat until the mixture begins to darken, then add drop by drop, while still heating, 3 millilitres, or a sufficient quantity, of *nitric acid PbT.* and continue the heating until white fumes are given off and the liquid is almost colourless. Cool, dilute with 5 millilitres of *water* and evaporate until white fumes are again given off. Cool, dilute with 100 millilitres of *water* and dissolve 2 grammes of *citric acid PbT.* in the liquid, then make alkaline with *solution of ammonia PbT.* and add 1 millilitre of *solution of potassium cyanide PbT.* Transfer to a separator, add 10 millilitres of *solution of diphenylthiocarbazone PbT.* and shake vigorously. Allow the liquids to separate and run off the lower layer. Repeat the extraction with two further quantities of 5 millilitres of *solution of diphenylthiocarbazone PbT.* Wash each solution with the same 10 millilitres of *water* contained in a second separator. Evaporate the mixed solutions to dryness ; add 0·5 millilitre of *sulphuric acid PbT.* to the residue and heat until white fumes are given off, then add, drop by drop, 0·5 millilitre of *nitric acid PbT.*, and continue the heating until white fumes are again given off and the liquid is almost colourless. Cool, dilute with 35 millilitres of *water*, add 5 millilitres of *acetic acid PbT.*, 10 millilitres of *solution of ammonia PbT.* and 1 millilitre of *solution of potassium cyanide PbT.*

Auxiliary solution prepared by mixing 5 millilitres of *acetic acid PbT.* with 30 millilitres of *water*, 10 millilitres of *solution of ammonia PbT.* and 1 millilitre of *solution of potassium cyanide PbT.*

[j] Solution prepared by boiling 5 grammes with 25 millilitres of *dilute nitric acid PbT.*, filtering, evaporating to dryness and dissolving in 50 millilitres of *water* ; 35 millilitres used for the primary solution and 10 millilitres for the auxiliary solution.

APPENDIX VII

QUANTITATIVE TEST FOR ARSENIC

METHODS OF PREPARING THE SOLUTION TO BE EXAMINED

Add the following Methods :—

Acidum Mandelicum. Limit **2** parts per million.
Treat 5 grammes as described under ' Acidum Acetylsalicylicum '.

Acidum Nicotinicum. Limit **2** parts per million.
Treat 5 grammes as described under ' Acidum Acetylsalicylicum '.

Bismuthi Subgallas. Limit **2** parts per million.
Treat 5 grammes as described under ' Bismuthi Salicylas '.

Magnesii Trisilicas. Limit **2** parts per million.
Treat 5 grammes as described under ' Barii Sulphas '.

Sodii Lactas. Limit **5** parts per million.
Treat 2 grammes as described under ' Potassii Acetas '.

Sodii Metabisulphis. Limit **5** parts per million.
Mix 2 grammes in a porcelain dish with 1 gramme of *potassium chlorate AsT.*, 10 millilitres of *water* and 15 millilitres of *hydrochloric acid AsT.*, heat to expel chlorine ; remove the last traces by a few drops of *solution of stannous chloride AsT.*, and add 35 millilitres of *water*.

Sodii Sulphas Exsiccatus. Limit **4** parts per million.
Treat 2·5 grammes as described under ' Acidum Citricum '.

Sulphanilamidum. Limit **1** part per million.
Dissolve 10 grammes in 50 millilitres of *water* and 15 millilitres of *stannated hydrochloric acid AsT.*

Suraminum. Limit **2** parts per million.
Treat 5 grammes as described under ' Methylthioninæ Chloridum '.

APPENDIX VIII

C. *LIMIT TEST FOR IRON*

Add the following reagent :—

Dilute Hydrochloric Acid FeT. *Dilute hydrochloric acid* which complies with the following additional test :—To 5 millilitres add 1 drop of *solution of potassium permanganate*, dilute to 50 millilitres with *water*, add 5 millilitres of *solution of ammonium thiocyanate*, and stir immediately ; no colour is produced.

APPENDIX XVI

SPECIAL PROCESSES USED IN PREPARING SOLUTIONS AND SUSPENSIONS FOR PARENTERAL INJECTION

**A. STERILISATION AND DISPENSING*

1. Sterilisation of Glass Vessels and Containers.

Glass vessels and containers are well freed from grease and are then sterilised by heating at a temperature not lower than 150° for one hour, or by exposing to saturated steam in an autoclave at 115° to 116° for thirty minutes.

2. Sterilisation by Heating in an Autoclave.

A solution or preparation to be sterilised by heating in an autoclave is distributed in suitable containers, which are then finally sealed. When the volume in each container does not exceed 100 millilitres, the containers are exposed to saturated steam at 115° to 116° for thirty minutes. When the volume in each container exceeds 100 millilitres, the containers are exposed for a longer time, sufficient to ensure that the whole of the solution in each container is maintained at the temperature of 115° to 116° for thirty minutes. For certain injections special conditions of temperature and periods of heating are stated in the monographs.

3. Sterilisation by Heating with a Bactericide.

To a solution or preparation to be sterilised by heating with a bactericide, Chlorocresol in the proportion of 0·2 per cent. w/v, or Phenylmercuric Nitrate in the proportion of 0·002 per cent. w/v, is added. The solution is distributed in the final containers, which are then finally sealed. When the volume in each container does not exceed 30 millilitres the containers are heated at 98° to 100° for thirty minutes. When the volume exceeds 30 millilitres, the containers are heated for a longer time, sufficient to ensure that the whole of the solution or preparation in each container is maintained at the temperature of 98° to 100° for thirty minutes.

Solutions of drugs to be used for intravenous injection shall not be prepared by this method when a single dose of the injection is greater than 15 millilitres.

Solutions of drugs to be used for intrathecal or intracisternal injection shall not be prepared by this method.

* This section replaces section A, British Pharmacopœia, 1932, pages 630–632, and Addendum, 1936, page 117.

4. Sterilisation by Filtration.

A solution to be sterilised by filtration is filtered through a sterile bacteria-proof filter. After the solution has been distributed with aseptic technique into the final sterilised containers, and these have been sealed, the solution is submitted to the *Tests for Sterility*, and must comply with these tests.

5. Sterilisation of Oily Solutions and Suspensions.

A solution or suspension in oil is distributed in the final containers, which are then either finally sealed, or temporarily closed so as to exclude bacteria. When the volume in each container does not exceed 30 millilitres, the containers are heated at 150° for one hour. When the volume in each container exceeds 30 millilitres, the containers are heated for a longer time, sufficient to ensure that the whole of the solution or suspension in each container is maintained at 150° for one hour. Containers which have been temporarily closed are then finally sealed. When the solution or suspension cannot be submitted to this temperature without the production of physical or chemical change, the solution or suspension is prepared by aseptic methods, and oil, which has previously been heated at 150° for one hour, is used. The solution or suspension is transferred to previously sterilised containers, and these are sealed so as to exclude bacteria.

6. Dispensing of Parenteral Injections.

Solutions or preparations of drugs to be administered by injection are dispensed in containers sealed so as to exclude bacteria.

Addition of an Antiseptic.

When the container is sealed so as to permit the withdrawal of successive doses on different occasions, the solution or preparation of the drug contains a suitable bacteriostatic agent in such a concentration as will prevent the growth of micro-organisms.

Rubber caps used for closing such containers are made from a good quality heat-vulcanised rubber. They are boiled in several changes of *water* and then either boiled for thirty minutes, or stored for not less than forty-eight hours, in a solution containing the same bacteriostatic agent, and in the same concentration, as that used in preparing the injection.

Solutions intended for intrathecal or intracisternal injection are dispensed only in containers each of which contains a single dose.

NOTE.—In any emergency in which the methods described above or any special method described in a monograph cannot be applied, it is the duty of the dispenser to inform the prescriber that complete sterilisation cannot be attempted, and to obtain the prescriber's approval for the method to be adopted.

• *STERILISATION OF SOLUTIONS OF PHARMACOPŒIAL SUBSTANCES*

Amylocainæ Hydrochloridum. *Heating with a bactericide*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Antimonii et Potassii Tartras. *Heating in an autoclave*, or *filtration*.

Antimonii et Sodii Tartras. *Heating in an autoclave*, or *filtration*.

Apomorphinæ Hydrochloridum. *Heating with a bactericide*, or *filtration*. The solution contains 0·05 per cent. of Sodium Metabisulphite. Decomposition with increase of toxicity may take place on keeping. A solution which has become green should be rejected. The containers comply with the *tests for limit of alkalinity of glass*.

Atropinæ Sulphas. *Heating with a bactericide*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Barbitonum Solubile. Dissolving in the requisite amount of Sterilised Water, immediately before use.

Bismuthi et Sodii Tartras. *Heating in an autoclave*, or *filtration*.

Caffeina et Sodii Benzoas. *Heating in an autoclave*, or *filtration*.

Calcii Chloridum Hydratum. *Heating in an autoclave*, or *filtration*.

Camphora. For a solution in oil, heating at 150° for one hour in a container which has been sealed by fusion of the glass, or dissolving in oil which has been previously heated at 150° for one hour.

Carbacholum. *Heating in an autoclave*, or *filtration*.

Cocainæ Hydrochloridum. *Heating with a bactericide*, or *filtration*.

Dextrosum. *Heating in an autoclave*, or *filtration*.

Diamorphinæ Hydrochloridum. *Heating with a bactericide*, or *filtration*.

• These directions replace those for Sterilisation of Solutions given in the monographs of The British Pharmacopœia, 1932, and the Addendum, 1936.

Digoxinum. *Heating in an autoclave*, Alcohol (70 per cent.) being used as solvent.

Emetinæ Hydrochloridum. *Heating with a bactericide*, or *filtration*.

Ergotoxinæ Æthanosulphonas. Dissolving the contents of a sealed container in the requisite amount of Sterilised Water, immediately before use. The containers comply with the *tests for limit of alkalinity of glass*.

Hexamina. *Heating in an autoclave*, or *filtration*. When a solution is sterilised by *heating in an autoclave* the container is sealed by fusion of the glass and is not opened until at least two hours after the solution has cooled to room temperature.

Hexobarbitonum Solubile. Dissolving in the requisite amount of Sterilised Water, immediately before use.

Histaminæ Phosphas Acidus. *Heating in an autoclave*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Homatropinæ Hydrobromidum. *Heating with a bactericide*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Hyoscinæ Hydrobromidum. *Heating with a bactericide*, or *filtration*. The containers comply with the *test for limit of alkalinity of glass*.

Indicarminum. *Heating in an autoclave*, or *filtration*. The solution should be protected from light.

Iodophthaleinum. *Filtration* or dissolving in the requisite amount of Sterilised Water, immediately before use. The containers comply with the *tests for limit of alkalinity of glass*.

Iodoxylum. *Filtration*, or dissolving in the requisite amount of Sterilised Water, immediately before use.

Morphinæ Hydrochloridum. *Heating with a bactericide*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Morphinæ Sulphas. *Heating with a bactericide*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Morphinæ Tartras. *Heating with a bactericide*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Neoarsphenamina. Dissolving the contents of a sealed container in the requisite amount of Sterilised Water. The solution rapidly decomposes, with increase of toxicity, and is used within five minutes after preparation.

Nikethamidum. *Heating in an autoclave*, or *filtration*.

Oleum Hydnocarpi Æthylicum. Heating at 150° for a period sufficient to ensure that the whole is maintained at that temperature for one hour.

Phenobarbitonum Solubile. Dissolving in the requisite amount of Sterilised Water, immediately before use.

Physostigminæ Salicylas. *Heating with a bactericide*, or *filtration*. The solution is prepared with freshly boiled and cooled Distilled Water. The containers comply with the *tests for limit of alkalinity of glass*.

Pilocarpinæ Nitras. *Heating in an autoclave*, or *filtration*.

Procainæ Hydrochloridum. *Heating with a bactericide*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Quininæ Dihydrochloridum. *Heating in an autoclave*, or *filtration*.

Quininæ Hydrochloridum. *Heating in an autoclave*, or *filtration*.

Sodii Bicarbonas. *Heating in an autoclave*, or *filtration*. When a solution is sterilised by *heating in an autoclave*, it is first sealed in a gas-tight container which is not opened until at least two hours after the solution has cooled to room temperature.

Sodii Chloridum. *Heating in an autoclave*, or *filtration*.

Sodii Citras. *Heating in an autoclave*, or *filtration*.

Sodii Salicylas. *Heating with a bactericide*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Sodii Thiosulphas. *Filtration*, or dissolving in the requisite amount of Sterilised Water, immediately before use.

Strophanthinum. *Heating with a bactericide*, or *filtration*.

Strychninæ Hydrochloridum. *Heating in an autoclave*, or *filtration*. The containers comply with the *tests for limit of alkalinity of glass*.

Sulpharsphenamina. Dissolving the contents of a sealed container in the requisite amount of Sterilised Water. The solution rapidly decomposes, with increase of toxicity, and is used within five minutes after preparation.

Suraminum. Dissolving in the requisite amount of Physiological Solution of Sodium Chloride, immediately before use.

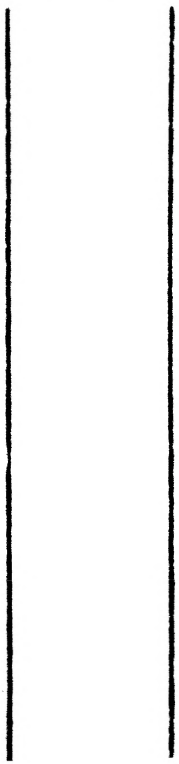
Tryparsamidum. Dissolving in the requisite amount of Sterilised Water, immediately before use.

INDEX

The index is arranged according to the alphabetical order of the English names of the official drugs and preparations. The Latin names of the official drugs and preparations, with the exception of Synonyms, are not included in the Index, because the text of the Addendum, like that of the Pharmacopœia, is arranged according to the alphabetical order of the Latin names.

Synonyms appear with cross references.

Italic figures refer to the Appendices.



British

Pharmacopoeia

Addendum